

North Carolina Floodplain Management

2008 Quick Guide



Floodplain Management Branch
www.nccrimecontrol.org/NFIP

**North Carolina Department of
Crime Control and Public Safety**

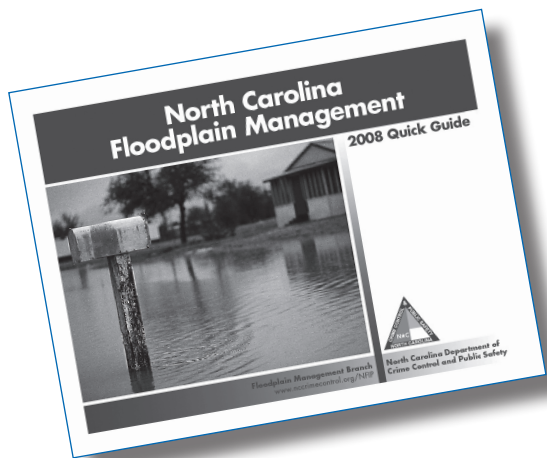
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About This Guide



This **Quick Guide** was prepared by the Floodplain Management Branch of the North Carolina Division of Emergency Management to help you understand more about why and how communities in the State of North Carolina manage floodplains to protect people and property.

Flood-prone communities adopt ordinances that detail the rules and requirements for floodplain development. In case of conflict, that ordinance and not this publication, must be followed. If you have questions, be sure to talk with your local planning, permit, engineering or floodplain management officials.

The Floodplain Management Branch coordinates the National Flood Insurance Program with North Carolina's local jurisdictions. Please send questions and comments on this **Quick Guide** to NFIP@ncem.org.

In association with:



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www.ncafpm.org

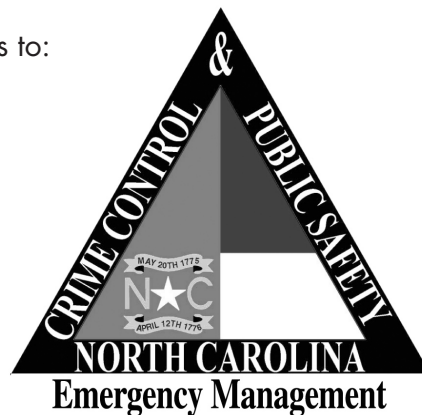
This publication is supported with funding from the Department of Homeland Security (FEMA). It does not necessarily reflect the views of that agency.

Introduction

The North Carolina Division of Emergency Management Floodplain Management Branch is pleased to provide this **Quick Guide** to help our citizens understand what floodplain management is and why floodplain development is regulated.

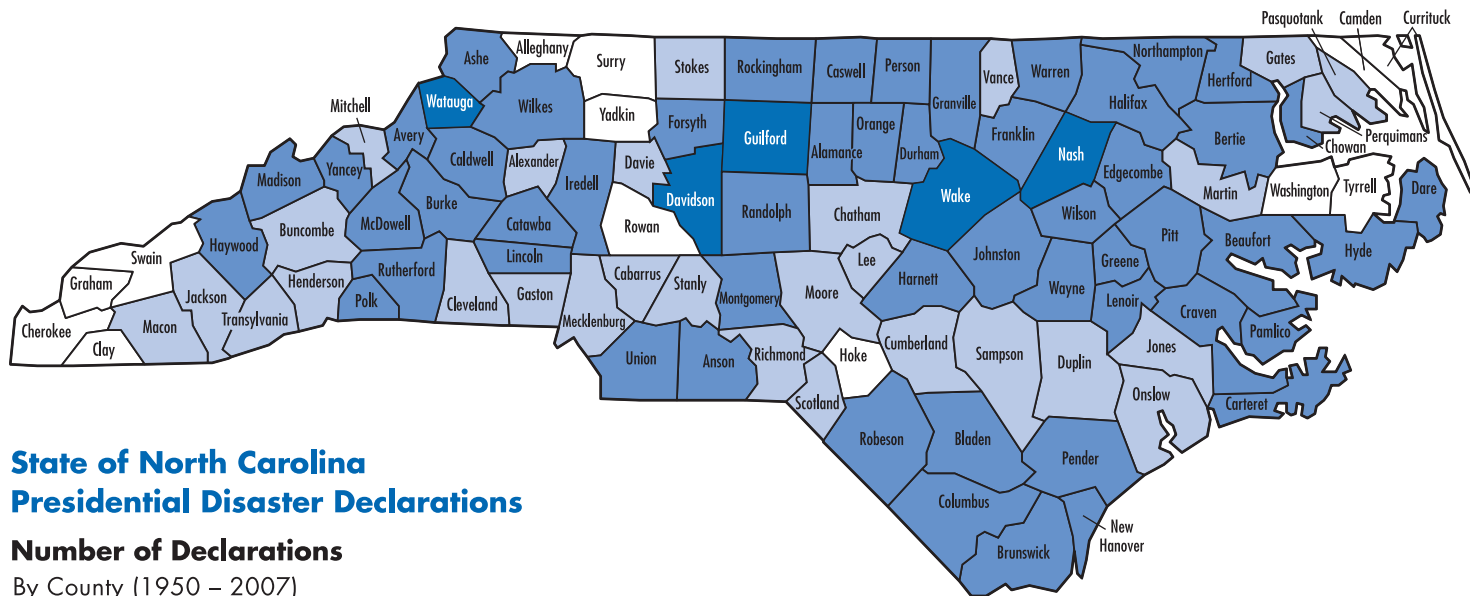
Counties and local communities regulate development in floodplains to:

- **Protect** people and property
- **Ensure** that federal flood insurance and disaster assistance are available
- **Save** tax dollars
- **Reduce** liability and law suits
- **Reduce** future flood losses



Floods have been, and continue to be, a destructive natural hazard in terms of economic loss to the citizens of North Carolina. Since 1978, federal flood insurance policy holders in North Carolina have received over \$751.6 million in claim payments. Even though that represents many insurance payments, most of the state's flood-prone property owners do not have flood insurance.

North Carolina's Disaster Declarations



Not all flood events are declared major disasters.
Many floods are local, affecting only small areas or a few watersheds.

Why Do Communities Regulate the Floodplain?

- **To protect people and property.** Floodplain management is about building smart. If we know where our high risk flood areas are located, we should be able to make reasonable decisions to help protect our families, homes and businesses.
- **To make sure that federal flood insurance and disaster assistance are available.** If your home or business is in the floodplain, and federal flood insurance isn't available, then you can't get some types of federal financial assistance. Home mortgages will be hard to find and you won't be able to get some types of state and federal loans and grants.
- **To save tax dollars.** Every flood disaster affects your community's budget. If we build smarter in and near floodplains, we'll have fewer problems the next time the water rises. Remember, federal disaster assistance isn't available for all floods. And even when the President declares a disaster, most of the time your community still has to pay a portion of the costs of evacuation, temporary housing, repair and clean-up.
- **To avoid liability and law suits.** If we know an area is mapped as a high-risk flood area, if we know people could be in danger, and if we know that buildings could be damaged, it makes sense to take reasonable protective steps when we develop and build.
- **To reduce future flood losses in North Carolina.** Development that complies with the minimum floodplain management requirements is better protected against major flood-related damage.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) was created by Congress in 1968 to protect lives and property and to reduce the financial burden of providing disaster assistance. The NFIP is administered by the Federal Emergency Management Agency (FEMA). Nationwide, over 20,000 communities participate in the NFIP — nearly all of North Carolina's flood-prone communities participate.



The NFIP is based on a mutual agreement between the federal government and communities. Communities that participate agree to regulate floodplain development according to certain criteria and standards.

The partnership involves:

- **Flood hazard maps.** In partnership with FEMA, the state produces flood maps in accordance with FEMA standards. The maps are used by communities, insurance agents and others.
- **Flood insurance.** Property owners in participating communities are eligible to purchase federal flood insurance for buildings and contents.
- **Regulations.** Communities must adopt and enforce minimum floodplain management regulations so that development, including buildings, is undertaken in ways that reduce exposure to flooding.

To learn more about the NFIP, including your potential flood risk and the approximate cost of a flood insurance policy, go to FEMA's FloodSmart website www.floodsmart.gov

Community Responsibilities

To participate in the National Flood Insurance Program, your community agrees to:

- **Adopt and enforce** a flood damage prevention ordinance.
- **Require** permits for all types of development in the floodplain ([see page 31](#)).
- **Assure** that building sites are reasonably safe from flooding.
- **Establish** Base Flood Elevations (BFE) where not determined by FEMA.
- **Require** new or substantially improved homes and manufactured homes to be elevated above the BFE.
- **Require** non-residential buildings to be floodproofed or elevated above the BFE.
- **Determine** if damaged buildings are *substantially* damaged.
- **Conduct** field inspections; cite and remedy violations.
- **Require** surveyed elevation information to document compliance ([see pages 40, 41, and 42](#)).
- **Carefully consider** requests for variances.
- **Resolve** non-compliance and violations.
- **Advise and work** with FEMA and the state when updates to flood maps are needed.



NATIONAL
FLOOD
INSURANCE
PROGRAM

Flood Insurance: Property Owner's Best Protection

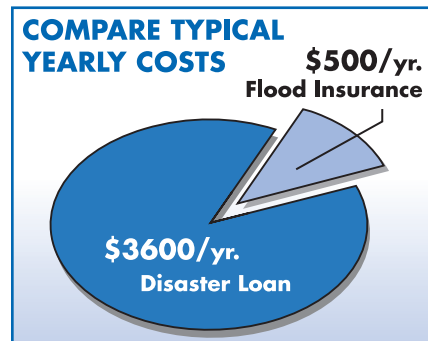
Who needs flood insurance? Federal flood insurance is required for all buildings in mapped Special Flood Hazard Areas (SFHAs) shown on FEMA's maps if they are financed by federally-backed loans or mortgages. All homeowners, business owners and renters in communities that participate in the NFIP may purchase federal flood insurance on any building and its contents, even if outside of the mapped flood zone. If your home is in the mapped SFHA, you are five times more likely to be damaged by flood than by a major fire.

Not in a mapped floodplain? Unfortunately, it's often after a flood that many people discover that their home or business property insurance does NOT cover flood damage. Approximately 25% of all flood damage occurs in low risk zones, commonly described as being "outside the mapped flood zone."

Protected by a levee or dam? Even if you live in an area protected by levees or other flood control structures, there is a residual risk that those structures will be overtopped or fail. If your community's levee provides "100-year" flood protection, there is still a chance that a higher flood will cause flooding.

What about disaster grants and loans? Federal disaster grants do not cover most losses, and repayment of a disaster loan can cost many times more than the price of a flood insurance policy.

Want to know more? Learn more at www.floodsmart.gov. To purchase a policy, call your insurance agent. To get the name of an agent in your community, call the NFIP's toll free number (888) 356-6329.



The NFIP's Community Rating System (CRS)

The NFIP's CRS gives "extra credit" to communities in the form of reduced flood insurance premiums. Communities must apply to the CRS and commit to implement and certify activities that contribute to reduced flood risk. Examples of actions your community can take to reduce the cost of your insurance premiums include:

- Preserve open space in the floodplain
- Enforce higher standards for safer development
- Undertake engineering studies and prepare flood maps
- Obtain grants to buy out or elevate houses or to floodproof businesses
- Maintain drainage systems
- Monitor flood conditions and issue warnings
- Inform people about flood hazards, flood insurance and how to reduce flood damage

Community officials can request assistance from CRS specialists to help with the application process and prerequisites. Check the online CRS Resource Center ([see page 72](#)).

Property owners in 76 North Carolina local jurisdictions that qualify for the CRS receive discounts ranging from 5% to 25%. Four communities are among the highest ranked in the Nation, including the cities of Charlotte and Kinston, and the towns of Grifton and Wrightsville Beach.

North Carolina's Floodplain Mapping Program

In 1999, Hurricane Floyd flooded thousands of square miles of eastern North Carolina and left thousands of people homeless. This disaster highlighted our vulnerability to natural disasters and the need for accurate, up-to-date floodplain maps.

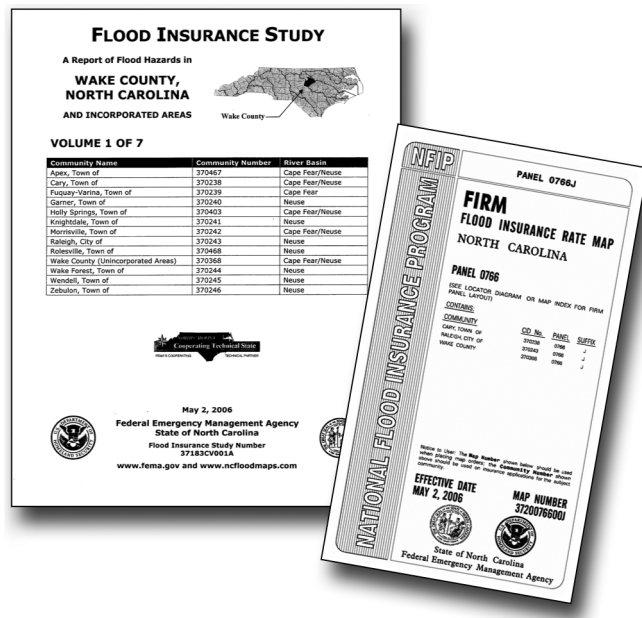
In 2000, FEMA designated North Carolina a Cooperating Technical State to formalize the partnership to modernize flood maps which created the North Carolina Floodplain Mapping Program.

The new Digital Flood Insurance Rate Maps (DFIRMs) are designed to view digitally on a computer within a Geographic Information System (GIS), as a raster image in Portable Document Format (pdf) or as paper maps. Digital flood maps are composites of base data, topographic data and flood layers which can be overlain with local parcel information or other data to more easily determine if a house or other property is or will be located in a Special Flood Hazard Area or floodway.



The Floodplain Mapping Program website is www.ncfloodmaps.com. Click on "Public Documents" for a series of fact sheets, including Frequently Asked Questions and information about how map changes affect flood insurance. [See page 72](#) to learn more about what's available online.

Looking for FEMA Flood Map Information?



- Visit North Carolina's Floodplain Mapping Information System website at www.ncfloodmaps.com. At this site you can view and download the state's digital flood hazard data (see page 11) in Geographical Information System (GIS) format or view and download current flood maps in Portable Document Format (pdf).
- Use your computer to visit the FEMA Flood Map Service Center at www.msc.fema.gov. You can view current and historical flood maps online, order hardcopy maps or download digital scans of maps.
- Order hardcopies online at www.msc.fema.gov or by calling (800) 358-9616.
- Check your city or county webpage. Many communities make available digital maps, including parcel data and flood hazard maps.

Need a fast answer? Visit your community's planning, engineering or permit office where paper flood maps are available for viewing by the public.

North Carolina Floodplain Mapping Information System (FMIS)

You can view, print or download digital versions of the DFIRMs produced by the North Carolina Floodplain Mapping Program by using the FMIS at www.ncfloodmaps.com (click on “Digital Flood Maps”).

- To find a specific area of interest, click on the desired county then use the drop down menus in the Search box to zoom in further by selecting a specific DFIRM, municipality and stream, or by entering the latitude/longitude or North Carolina state plane coordinates. Also, you may enter the street address in the Address Lookup box or navigate using the Zoom In, Zoom Out and Pan tools.
- When you’re zoomed in close enough, the FMIS viewer displays flood zones, Base Flood Elevations, cross sections and other data.
- Use the Print tool to print the image that shows in the FMIS viewer.
- To download a copy of a DFIRM in Portable Document Format (pdf), zoom in close enough to view the DFIRM panel grid lines, click on the Download DFIRM tool then click in the desired panel area.
- To download a copy of a FIS report, DFIRM index or GIS data, click on the Download Data tab and select the county from the drop down menu.
- To view a list of available GIS layers, click on the Layers tab then click the box next to the layer name to view a legend that explains how flood zones and other data are displayed.

FMIS Web Page Tools



Zoom In



Zoom Out



Pan



Print

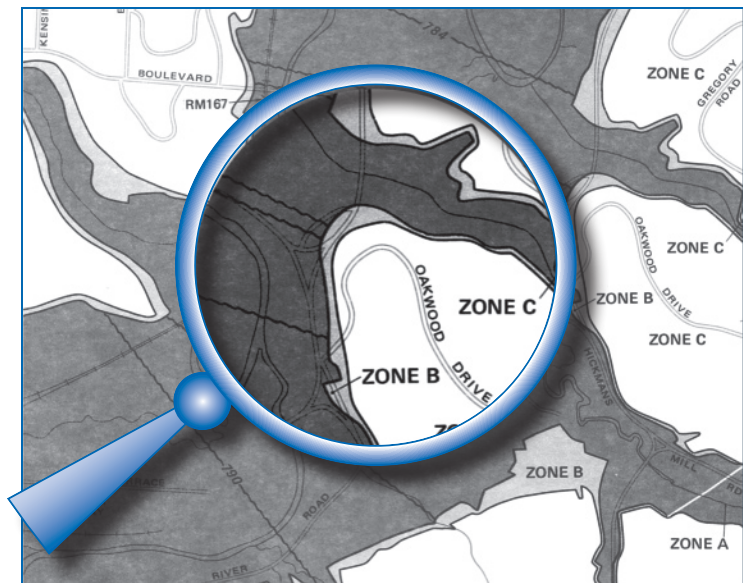


Download
DFIRM

Download Data

Layers

FIRMette: FEMA Flood Maps Online

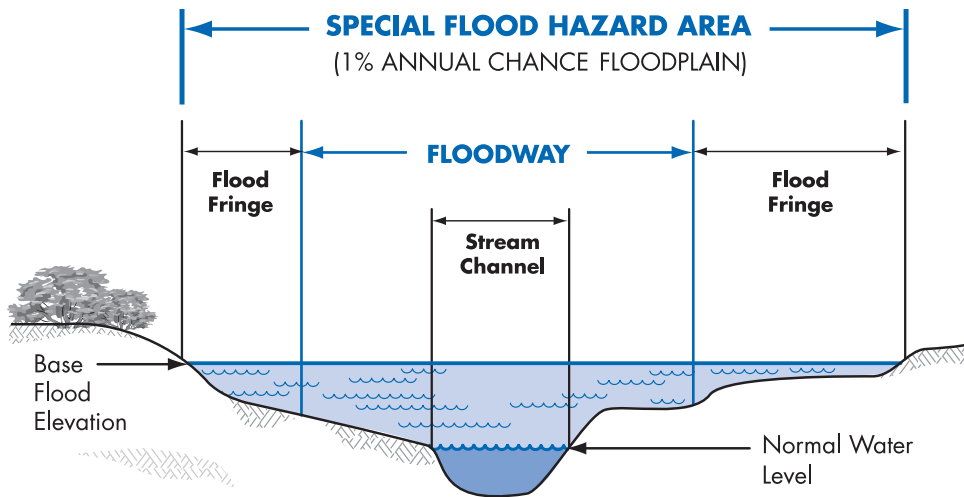


You can order paper maps or digital maps on CD-ROM from FEMA's Map Service Center ([see page 72](#)).

You can find and print a portion of a FIRM by using online tools at www.msc.fema.gov.

- Use "Product Search by Address" on the left OR click on "Product Catalog" at the top of the page, select "FEMA Issued Flood Maps", select the state, county and community, then click on "Find FEMA Issued Flood Maps"
- Click the "View" button to display the map panel and use "Zoom" to enlarge the map.
- Use the pan and zoom tools to find the specific area of interest – a miniature map on the left side of the screen shows a red box around the area you are viewing.
- Click the "Make a FIRMette" button and drag the pink translucent box over the area you wish to print.
- Select paper size and Adobe Acrobat (pdf) or Image File (tif).
- Your FIRMette will be displayed and you can print the map or save the file to your hard drive.

Understanding the Riverine Floodplain



For floodplains with Base Flood Elevations (BFEs) determined by detailed flood studies, the Flood Profile in the Flood Insurance Study shows water surface elevations for different frequency floods ([see page 19](#)). BFEs determined by Limited Detailed Studies are listed in tables in the FIS ([see pages 22](#) and [23](#)).



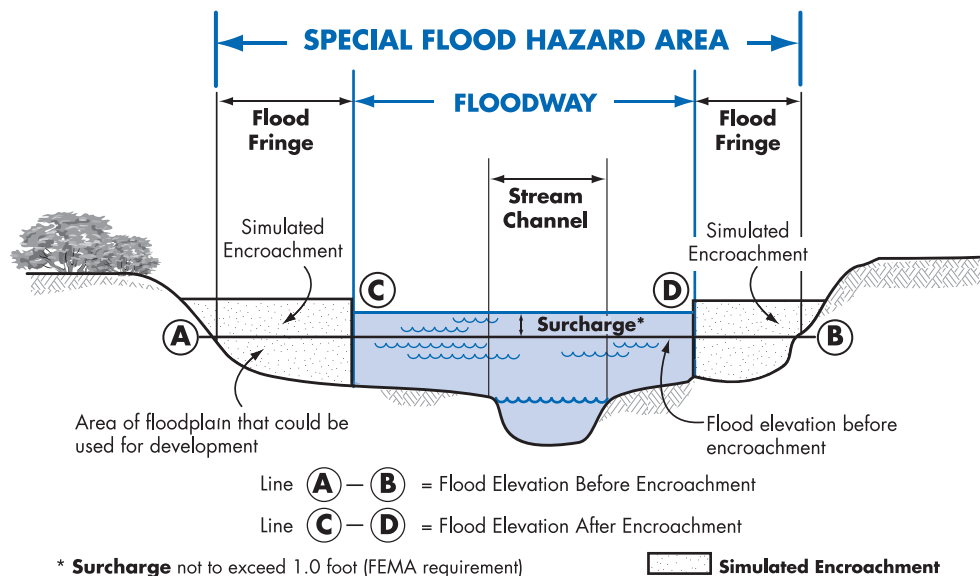
Terms and Definitions

The **Special Flood Hazard Area (SFHA)** is that portion of the floodplain subject to inundation by the base flood (1% annual chance) and/or flood-related erosion hazards. Riverine SFHAs are shown on new format FIRMs as Zones A, AE, AH, AO, AR, and A99. Older FIRMs may have numbered A Zones (A1-A30).

[See page 14](#) to learn about the floodway, the area of the floodplain where floodwaters usually flow faster and deeper.

[See page 7](#) to learn about flood insurance requirements in SFHAs.

Understanding the Floodway



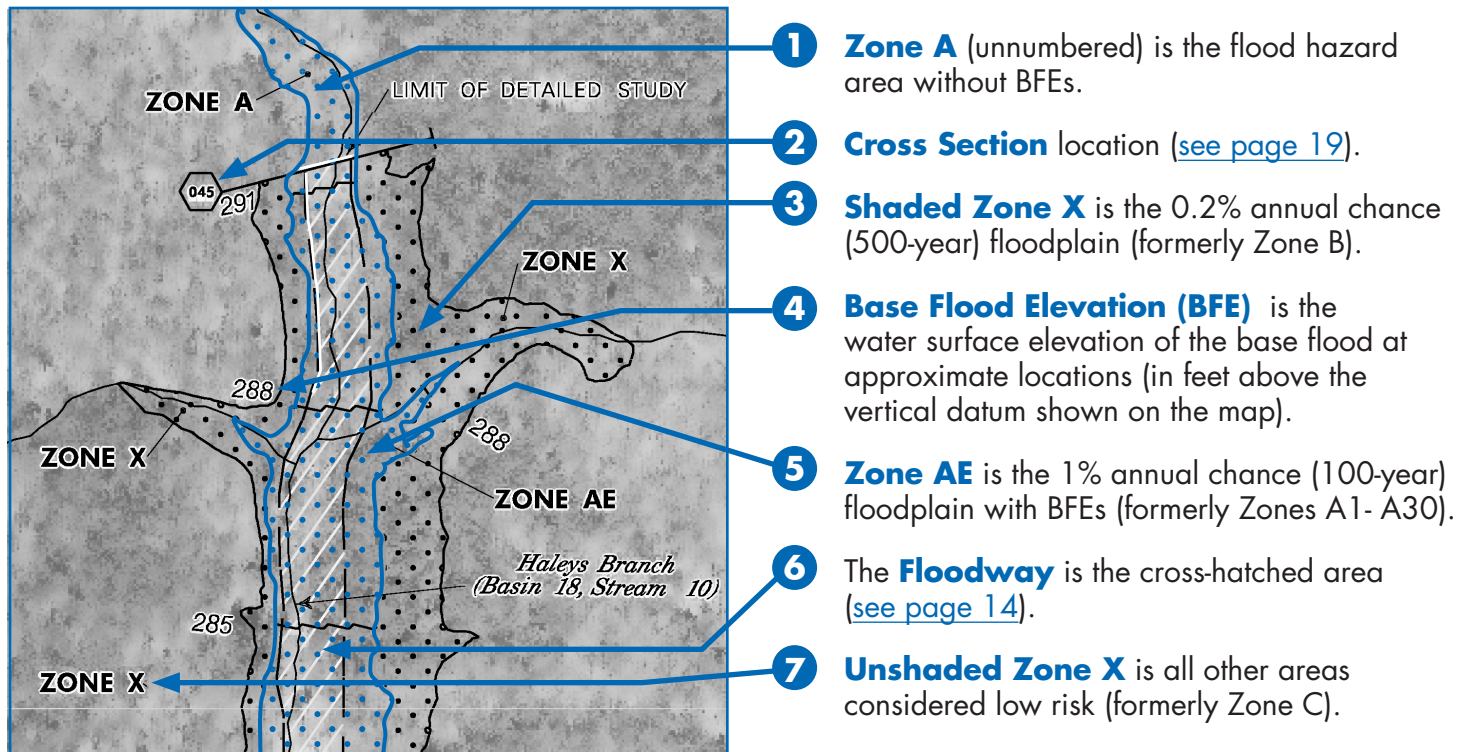
Terms and Definitions

The **Floodway** is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to pass the base flood discharge without increasing flood depths.

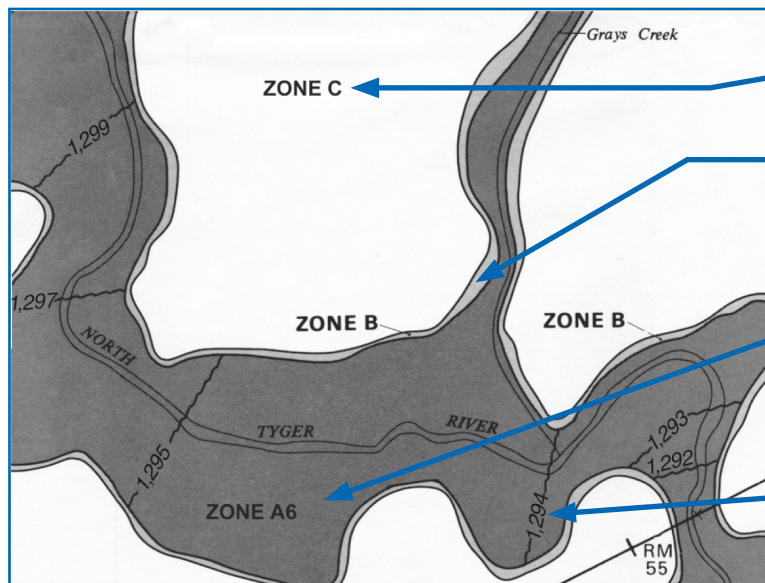
Computer models of the floodplain are used to simulate “encroachment” or development in the flood fringe in order to predict where and how much the Base Flood Elevation would increase if the floodplain is allowed to be developed.

For any proposed floodway development, the applicant must provide evidence that “no impact” will occur or obtain a Conditional Letter of Map Revision (CLOMR) before a local floodplain permit can be issued ([see page 44](#)). You will need an experienced registered professional engineer to make sure your proposed project either won’t increase flooding or that any increases do not impact structures on other properties.

Flood Insurance Rate Map (Riverine)



Old Format Flood Insurance Rate Map



RIVERINE FLOOD HAZARD ZONES

- 1 Zone C** (or Zone X) is all areas considered to be low risk.
- 2 Zone B** (or shaded Zone X) is moderate risk areas subject to flooding by the 0.2% annual chance flood (500-year).
- 3 Zone A, Zones A1-A30 or Zone AE** are subject to flooding by the base or 1% annual chance flood (100-year), and are considered high risk areas.
- 4 Base Flood Elevation (BFE)** is the water surface elevation of the base flood, in feet above the vertical datum.

FEMA prepares Flood Insurance Rate Maps (FIRMs) to show areas that are at high risk of flooding. These “old format” FIRMs, and companion Flood Boundary and Floodway Maps (next page), are being replaced as part of the North Carolina Floodplain Mapping Program ([see page 9](#)).

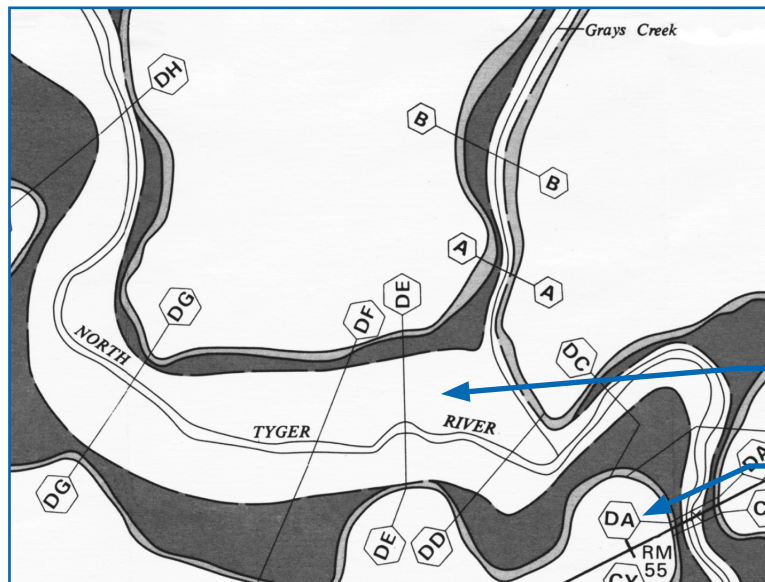
Old Format Flood Boundary and Floodway Map



Important

Information

Floodway maps do not identify flood zones or BFEs. Check the companion FIRM for that information. [Page 16](#) shows the FIRM that matches the map clip to the left.



1

The Floodway is the unshaded area around the waterway centerline.

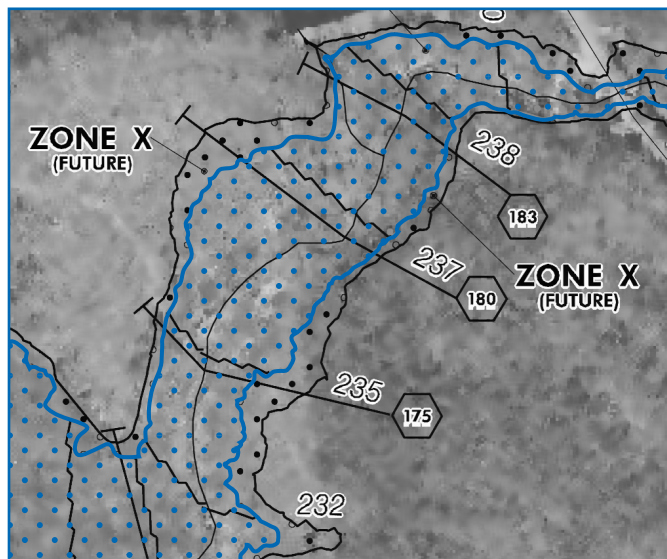
2

Cross Section location, where ground surveys determined the shape of the land and how constrictions such as bridges and culverts affect the flow of floodwater.

FEMA prepared Floodway maps as companions to many “old format” FIRMs. You should check to see if your project will be in the floodway because additional engineering may be required ([see page 44](#)).

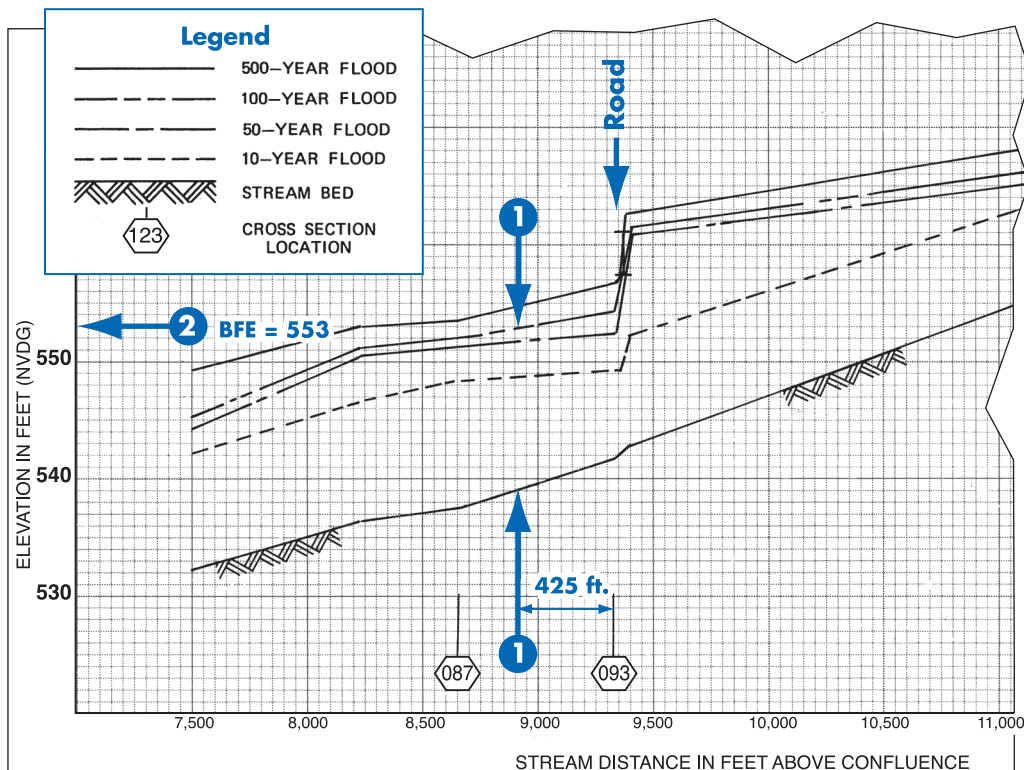
Future Conditions Floodplain Mapping

Future development will cause more runoff which will increase flood frequency and flood levels. Some communities ask for flood maps that show the future conditions floodplain determined by assuming the watershed is fully developed. If the flood map shows a shaded area that is labeled **Zone X (FUTURE)**, the area is the future conditions 1% annual chance (100-year) floodplain.



- Flood insurance is not required for buildings in mapped **Zone X (FUTURE)** areas – it is available at reduced rates.
- The future conditions flood elevation may be a few feet higher than the current condition BFE shown on the FIRM.
- Communities usually require new and substantially improved buildings in **Zone AE** and **Zone X (FUTURE)** areas to be elevated to or above the future conditions flood elevation. These buildings will continue to be protected as more development occurs and floods become more severe – and flood insurance will cost less ([see page 39](#)).

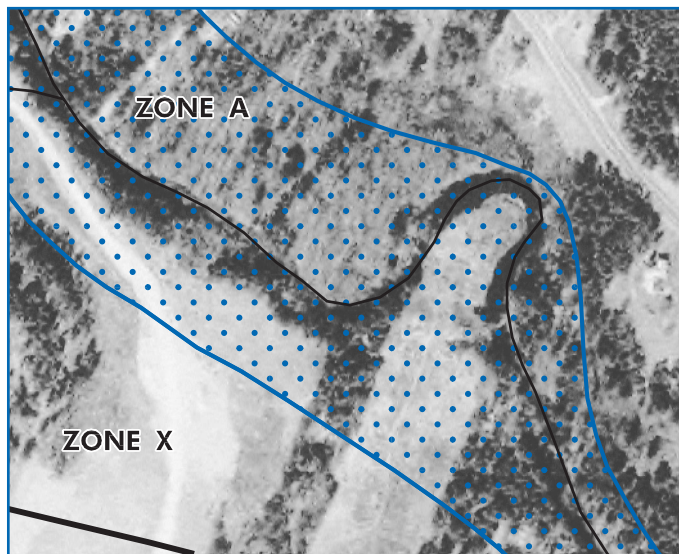
Use the Riverine Flood Profile to Determine Riverine BFEs



Flood Profiles from Flood Insurance Study reports can be used to determine the BFE at a specific site. Profiles also show estimated water surface elevations for floods other than the 1% annual chance flood (100-year).

- On the effective flood map, locate your site by measuring the distance, along the center-line of the stream channel, from a known point such as a road or cross section, for example, 087 or 093.
- Scale that distance on the Flood Profile and read up to the profile of interest, then across to determine the BFE, to the nearest 1/10 of a foot.

Approximate Flood Zones and Unnumbered A Zones



In unnumbered A Zones, local flood ordinances prohibit development within a specified distance from the stream bank. Use of BFE data available from any source is required when development is proposed outside of this setback distance. For assistance, contact your community's planning, engineering or permit office, or the Floodplain Management Branch ([see page 1](#)).

The FEMA publication *Managing Floodplain Development in Approximate Zone A Areas* (FEMA 265) is useful for engineers and community officials.

de **Terms and Definitions**

An **Approximate or Unnumbered A Zone** is a special flood hazard area where BFE information is not provided.

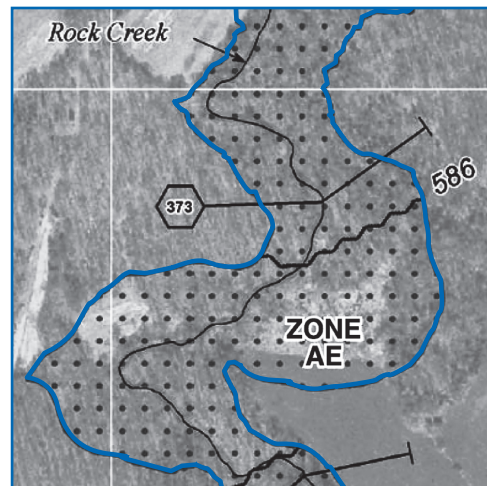
Even if the estimated BFE indicates flooding might be only a foot or two deep, it is recommended that the lowest floor be at least 2 feet above the highest adjacent grade. Not only does this improve flood protection, but lower flood insurance premiums may apply.

AE Flood Zones With Non-Encroachment Areas

Most riverine flooding sources that are shown on older North Carolina FIRMs with **Approximate A Zones** or **Unnumbered A Zones** ([see page 20](#)) have been studied by the Limited Detailed Study method and remapped as **AE Zones** with BFEs on the new North Carolina DFIRMs. This method determines a **Non-Encroachment Area** (not shown on the maps) which serves the same function as a floodway.

The Limited Detailed Flood Hazard Data tables in the Flood Insurance Study reports list BFE data and non-encroachment area widths at all flood study cross sections ([see page 23](#)).

If your property is near a river or stream that is mapped as an AE Zone without a floodway, check with your community's planning, engineering, or permit office to see if your project is within a Non-Encroachment Area.



Terms and Definitions

Non-Encroachment Area is the portion of the floodplain where proposed construction, placement of fill, or similar alterations of topography require a “No Impact” Certification due to the potential adverse effects such development would have on conveyance of the base flood ([see page 44](#)).

Limited Detailed Study

Limited Detailed Study (LDS) is the term given to a method of calculating Base Flood Elevations using cross section information from available topography (with limited or no surveyed field data). Limited Detailed Studies are performed to improve flood hazard information in areas that were originally mapped as Approximate A Zones (without BFEs) or were not previously studied.

Waterways for which the Limited Detailed Study method is used have BFEs, SFHA boundaries and cross-sections shown on the FIRM. Floodways are not shown on the FIRMs and flood profiles are not provided in the Flood Insurance Study report. BFEs and other data are listed in the Limited Detailed Flood Hazard Data table in the FIS report.

Floodways are not shown when the LDS method is used. When the FIRM shows BFEs but not floodways, the NFIP regulations require communities to ensure that no new construction, substantial improvement, or other development (including fill), is permitted “unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point.

To avoid requiring analyses for every development proposal, the North Carolina LDS method determines a “non-encroachment area” which communities adopt and then regulate the same as a floodway. Non-encroachment area widths are listed in the Limited Detailed Flood Hazard Data table ([see page 23](#)).

Using Data from Limited Detailed Studies

Streams studied using the Limited Detailed Study method do not have a flood profile in the FIS report. Use the Limited Detailed Flood Hazard Data table in the FIS and follow these steps to determine BFEs and non-encroachment widths at a specific location:

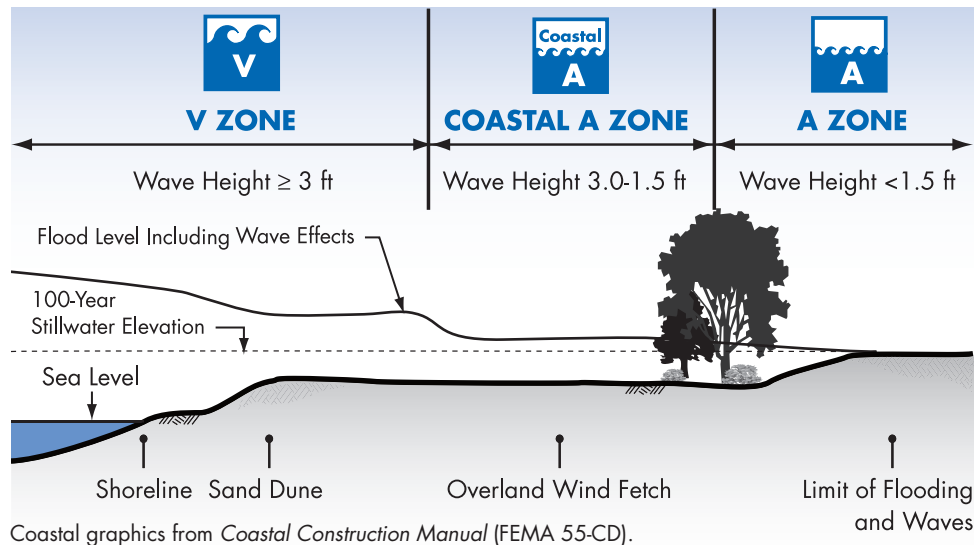
1. On the FIRM, find the upstream and downstream cross sections closest to the site.
2. Follow the stream centerline and measure the distance from the site to the nearest cross section.
3. In the table, find the 1% Annual Chance Water Surface Elevation values for both cross sections.
4. Numerically interpolate to find the BFE at the site (see instructions online at www.ncfloodmaps.com/pubdocs/limited_detailed.pdf).
5. Find the Non-Encroachment Widths for both cross sections – use the wider value measured from the center of the stream or numerically interpolate to find the value at the site.

Limited Detailed Flood Hazard Data (partial)

Cross Section	Stream Section	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet)*
FISHER BRANCH				
120	12,043	1,572	711.7	74 / 35
126	12,567	1,572	715.4	35 / 68
130	12,996	1,429	718.1	42 / 34
134	13,427	1,429	721.2	34 / 71

* Left/Right distance from the mapped center of stream to non-encroachment boundary based on a 1.0 foot or less surcharge (looking downstream)

Understanding the Coastal Floodplain



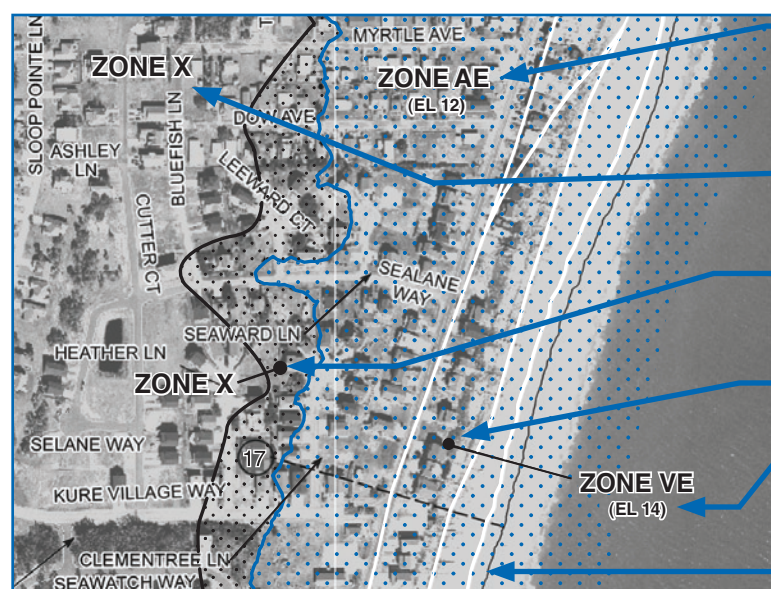
Areas subject to Coastal A Zone conditions (wave heights between 3 feet and 1.5 feet) are not shown on FIRMs ([see page 26](#)). Some communities may treat the CAZ area as a V Zone and require development to comply with the V Zone requirements.

Terms and Definitions

The **Coastal High Hazard Area (V Zone)** is the Special Flood Hazard Area that extends from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action. The area is designated on the FIRM as Zone VE.

The term **Coastal A Zone** refers to the portion of the SFHA landward of the V Zone or landward of a shoreline that does not have a mapped V Zone. The principal sources of flooding are associated with astronomical tides, storm surges, seiches or tsunamis. Coastal A Zones may be subject to wave effects, velocity flows, erosion, scour or combinations of these forces.

Flood Insurance Rate Map (Coastal)

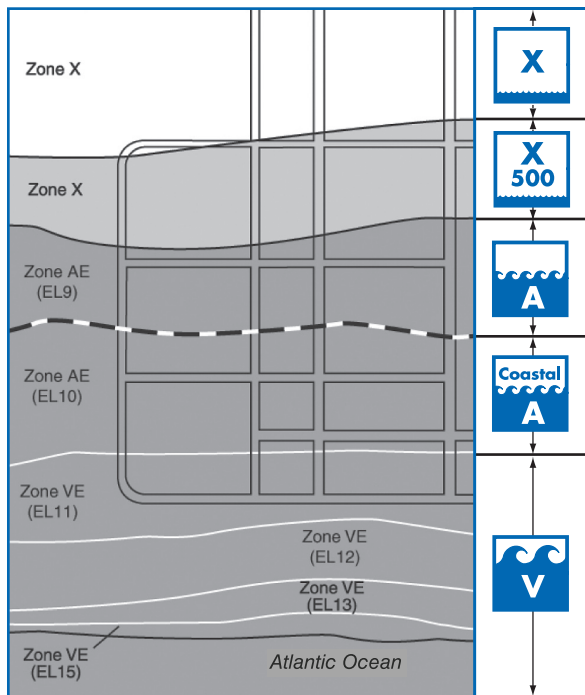


- 1 **Zone AE** is subject to flooding by the base or 1% annual chance (100-year) flood, and waves less than 3 feet high, (formerly called Zones A1-A30).
- 2 **Unshaded Zone X** is the area of minimal flood risk outside the 500-year floodplain, formerly called Zone C.
- 3 **Shaded Zone X** is subject to flooding by the 0.2% annual chance (500-year) flood, formerly called Zone B.
- 4 **Zone VE** is where wave heights are expected to be 3 feet or more.
- 5 **Base Flood Elevation (BFE)** is the water surface elevation (in feet above the vertical datum shown on the map).
- 6 **Shoreline**



In Coastal Barrier Resource System Areas (CBRS), known as "CoBRA Zones", and in Otherwise Protected Areas (OPAs) shown on the FIRM, NFIP flood insurance is not available for new or substantially improved structures built after the date the areas were identified.

The Coastal A Zone (CAZ)



For illustrative purposes only. Flood Insurance Rate Maps do not show the Coastal A Zone Boundary depicted in this example (heavy dashed line).

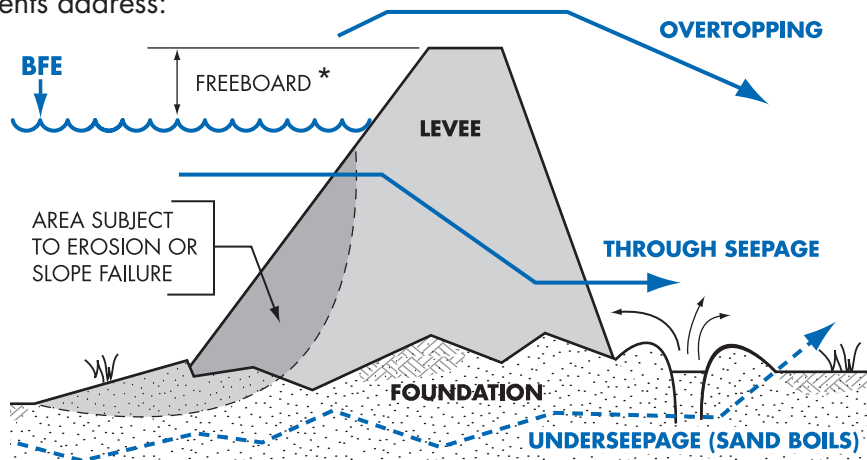
- Post-flood evaluations and laboratory tests confirm that breaking waves as small as 1.5 feet high cause damage to walls and scour around foundations.
- CAZs are not shown on FIRMs.
- CAZ conditions are found inland of V Zones and along shorelines without V Zones.
- CAZ conditions occur where stillwater depths are between 2 and 4 feet, which can support 1.5 to 3-foot waves ([see page 24](#)).
- V Zone construction methods are recommended in CAZs, including pile, post and column foundations and breakaway walls around enclosures.
- Raising the lowest horizontal structural member of the lowest floor higher than the BFE is recommended.
- Federal flood insurance in CAZs is rated using A Zone rates (lower than V Zone rates).

Levee Certification for FEMA Flood Maps

Many levees are designed to protect land against flooding from the base flood. In order for FEMA to show those areas as outside of the Special Flood Hazard Area, communities and levee owners must certify that levees meet certain design criteria. Certification presents significant challenges during the map revision process.

Communities that have levees should determine as soon as possible whether certification will be required. Pursuant to FEMA's Procedural Memoranda 34 and 43, and as outlined in federal regulations at 44 CFR Section 65.10, the documentation requirements address:

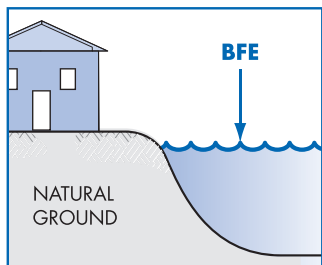
- Freeboard
- Closures
- Embankment protection for erosion
- Embankment and foundation stability
- Settlement
- Interior drainage and seepage
- Operation and maintenance plans
- Other site specific criteria



* Freeboard is the distance between the BFE and the top of the levee; for FEMA accreditation freeboard is usually 3 feet.

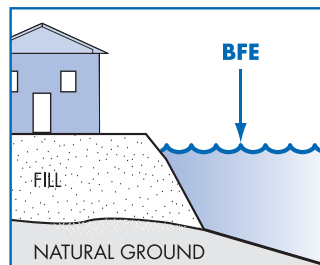
Flood Map Revisions Processed by FEMA

The most accurate information available is used to make flood maps, including topographic base maps and detailed engineering methods or methods of approximation. Map revisions are issued if technical data are submitted to support the changes. Map changes processed by North Carolina are described on the next page. The following map revisions are processed by FEMA:



Letter of Map Amendment (LOMA) is an official amendment to an effective FIRM that may be issued when a property owner provides additional technical information from a professional land surveyor or civil engineer, such as ground elevation relative to

the BFE. Lenders may waive the flood insurance requirement if the LOMA removes a building site from the SFHA because natural ground at the site is above the BFE.



Letter of Map Revision Based on Fill (LOMR-F) is an official revision to an effective FIRM that is issued to document FEMA's determination that a structure or parcel of land has been elevated by fill

above the BFE, and therefore is no longer in the SFHA. Lenders may waive the insurance requirement if the LOMR-F removes a building site from the SFHA.

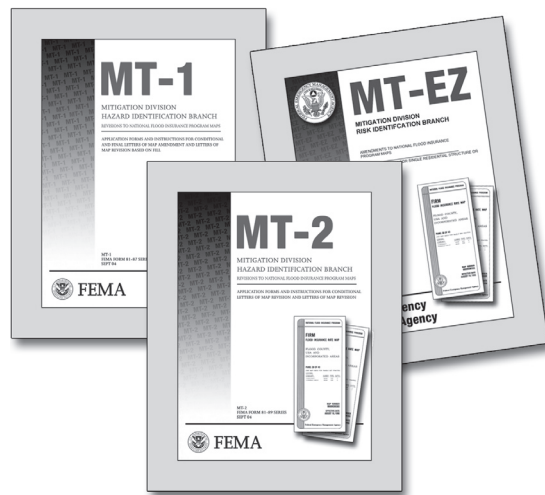
Check online at www.fema.gov/plan/prevent/fhm/ for more about map revisions for different user groups (homeowners, floodplain managers, surveyors, engineers and insurance professionals).

Also learn about eLOMA, a web-based application for surveyors and engineers to submit applications for simple LOMAs to FEMA.

Flood Map Revisions Processed by North Carolina

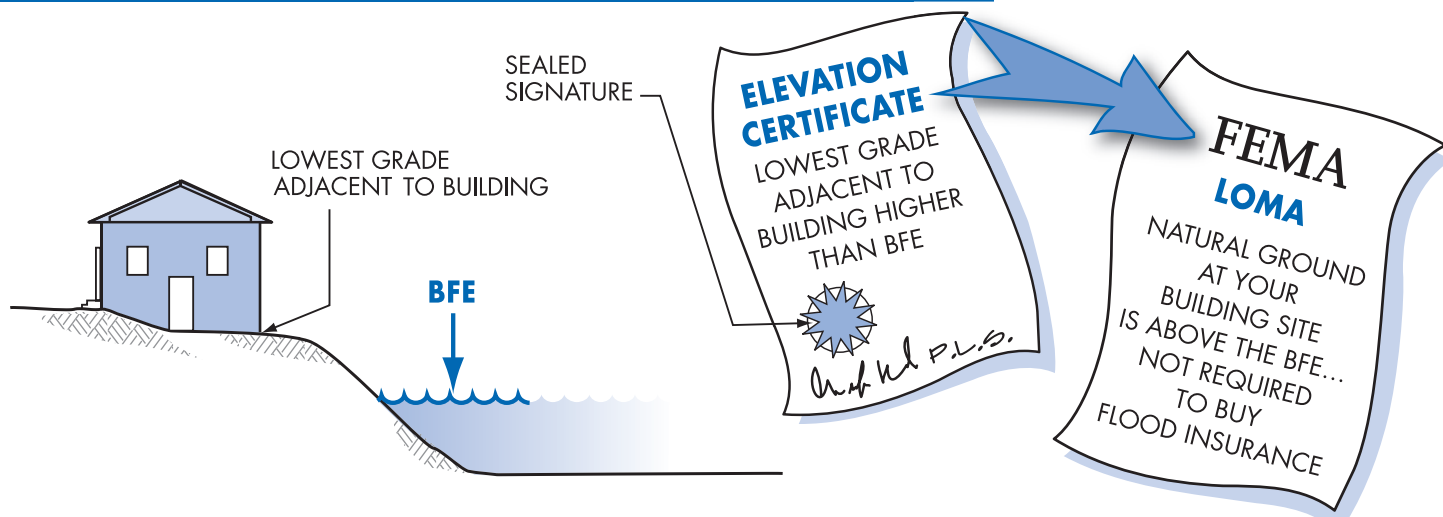
- **Conditional Letter of Map Revision (CLOMR)** is a letter commenting on whether a proposed project, if built as shown on the submitted documentation, would meet the standards for a map revision. Communities may require this evidence prior to issuing a permit, and the Certificate of Occupancy/Compliance should be withheld until receipt of the final LOMR based on "as-built" documentation and certification.
- **Letter of Map Revision (LOMR)** is an official revision to an effective FIRM that may be issued to change flood insurance risk zones, special flood hazard areas and floodway boundary delineations, BFEs and/or other map features. Lenders may waive the insurance requirement if the approved map revision shows buildings to be outside of the SFHA.

Go to www.ncfloodmaps.com/lomc and click on "NC MT-2 LOMC Fact Sheet" for instructions on how to submit a CLOMR or LOMR application for a proposed project in North Carolina.



To download the forms used to submit map revisions, go to www.fema.gov/library, click on "Search by Resource Title," and search on "MT-EZ", "MT-1" and "MT-2".

Is Your Building Site Higher than the BFE?



If your land is shown on the map as "in" the SFHA, but your building site is higher than the Base Flood Elevation (BFE)... get a professional land surveyor or civil engineer to complete a FEMA Elevation Certificate. Submit a request for a Letter of Map Amendment to FEMA along with the EC to verify that your structure is above the BFE ([see page 28](#)). If FEMA approves your request, it will remove the mandatory federal requirement to purchase flood insurance. Keep the certificate and the LOMA with your deed; they will help future buyers.

Activities in SFHAs that Require Local Permits and Approvals

- Construction of new buildings
- Additions to existing buildings
- Substantial improvements of existing buildings
- Renovation of existing building interiors
- Repair of substantially damaged buildings
- Placement of manufactured (mobile) homes
- Subdivision of land
- Construction or placement of temporary buildings and accessory structures
- Construction of agricultural buildings
- Construction of roads, bridges and culverts
- Placement of fill, grading, excavation, mining and dredging
- Alteration of stream channels



You need local floodplain development permits for these and **ANY** land-disturbing activities in SFHAs.

Some Key Floodplain Development Permit Review Steps

The permit reviewer has to check many things. Some of the key questions are:

- Is the site near a watercourse?
- Is the site in the mapped FEMA floodplain or floodway?
- Have other state and federal permits been obtained?
- Is the site reasonably safe from flooding?
- Does the site plan show the flood zone, Base Flood Elevation and building location?
- Is substantial improvement of an older building proposed?
- Is an addition proposed?
- Will new buildings and utilities be elevated properly?
- Will manufactured homes be properly elevated and anchored?
- Do the plans show an appropriate and safe foundation?
- Will the owner/builder have to submit an as-built Elevation Certificate?



Applying for a Floodplain Development Permit

Owner's Name: <u>DAVID & SALLY JONES</u>		Part of a Sample Application (may vary by community)
Site Address, Tax #, Parcel #: <u>781 REED STREET, 400-33A-002</u>		
A. Description of Work 1. Proposed Development Description: <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> Dredging <input type="checkbox"/> Alteration or Repair <input type="checkbox"/> Manufactured/Modular <input checked="" type="checkbox"/> Filling <input type="checkbox"/> Logging <input type="checkbox"/> Grading <input type="checkbox"/> Other 2. Size and Location of Development <u>SINGLE FAMILY (2,000 CY FILL);</u> <u>FLOOD FRINGE OF OAK CREEK</u>		Community, Map, and Elevation Data: 1. Community No: <u>370171</u> 2. Panel No: <u>3720312700</u> 3. Zone <u>AE</u> 4. Base Flood Elevation <u>59.2</u> 5. Required Lowest Floor Elevation (including basement) <u>60.2</u> 6. If floodproofed, required floodproofing elevation <u>N/A</u> 7. Elevation to which all attendant utilities, including all heating, duct work, and electrical equipment will be installed or floodproofed: <u>60.2</u>
3. Type of Construction <input checked="" type="checkbox"/> New Residential <input type="checkbox"/> Improvement <input type="checkbox"/> New Non-Residential <input type="checkbox"/> Renovation <input type="checkbox"/> Addition <input checked="" type="checkbox"/> Accessory structure <input type="checkbox"/> Temporary		
Applicant's Signature: <u>David M. Jones</u>		

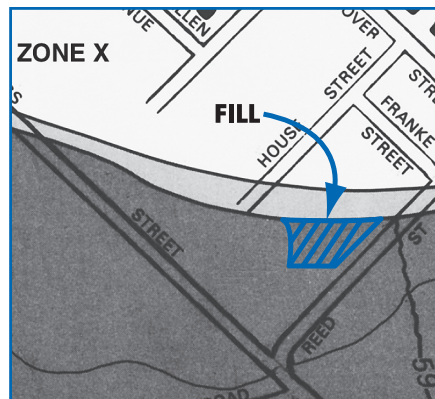
Good information will lead to better construction and less exposure to future flood damage.



Important

Information

You must get all permits and certifications **before** you do work in a floodplain.



Coastal Area Management Act (CAMA) Permits

The North Carolina Coastal Resources Commission established four categories of Areas of Environmental Concern: (1) the Estuarine and Ocean System; (2) the Ocean Hazard System (includes V Zones shown on FIRMs); (3) Public Water Supplies; and (4) Natural and Cultural Resource Areas.

CAMA permits are required for development activities proposed in Areas of Environmental Concern found in the state's 20 coastal counties. Certain activities are exempt, including some types of minor maintenance and improvements, as well as accessory buildings usually found with existing structures, if no filling of estuarine or navigable waters or coastal marshland is involved.

There are three types of CAMA permits:

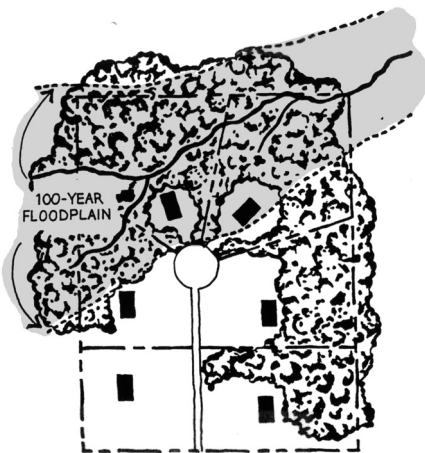
- **Minor Permits**, which are used for projects – such as single-family houses – that do not require major permits or general permits; minor permits are handled by local governments under contract with the state.
- **General Permits**, which are used for routine projects that usually pose little or no threat to the environment.
- **Major Permits**, which are reviewed by 10 state and 4 federal agencies.



North Carolina Department
of Environment and
Natural Resources

CAMA is administered by the Department of Environment and Natural Resources. Download the *CAMA Handbook for Development in Coastal North Carolina* and other resources at dcm2.enr.state.nc.us. Contact a district office to obtain a permit application and to determine if your proposed activity is exempt.

Safer Uses of the Floodplain

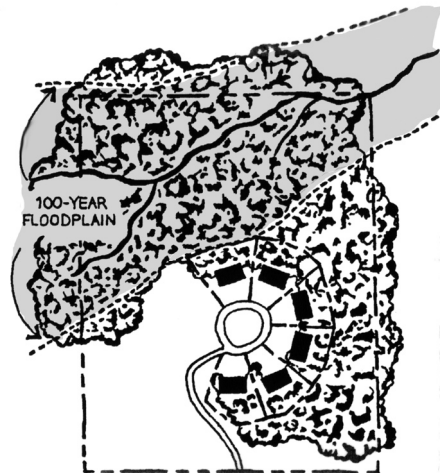
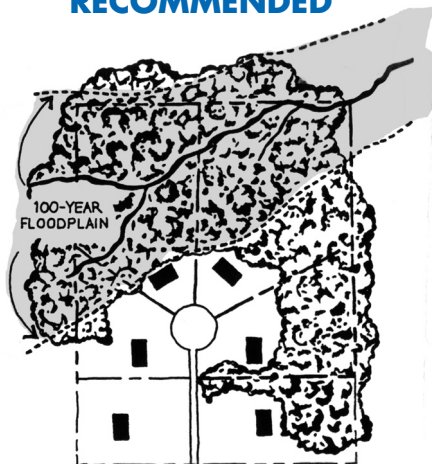


All land subdivided into lots, some homesites and lots partially or entirely in the floodplain.

NOT RECOMMENDED

All land subdivided into lots, some lots partially in the floodplain, setbacks modified to keep homesites on high ground.

RECOMMENDED

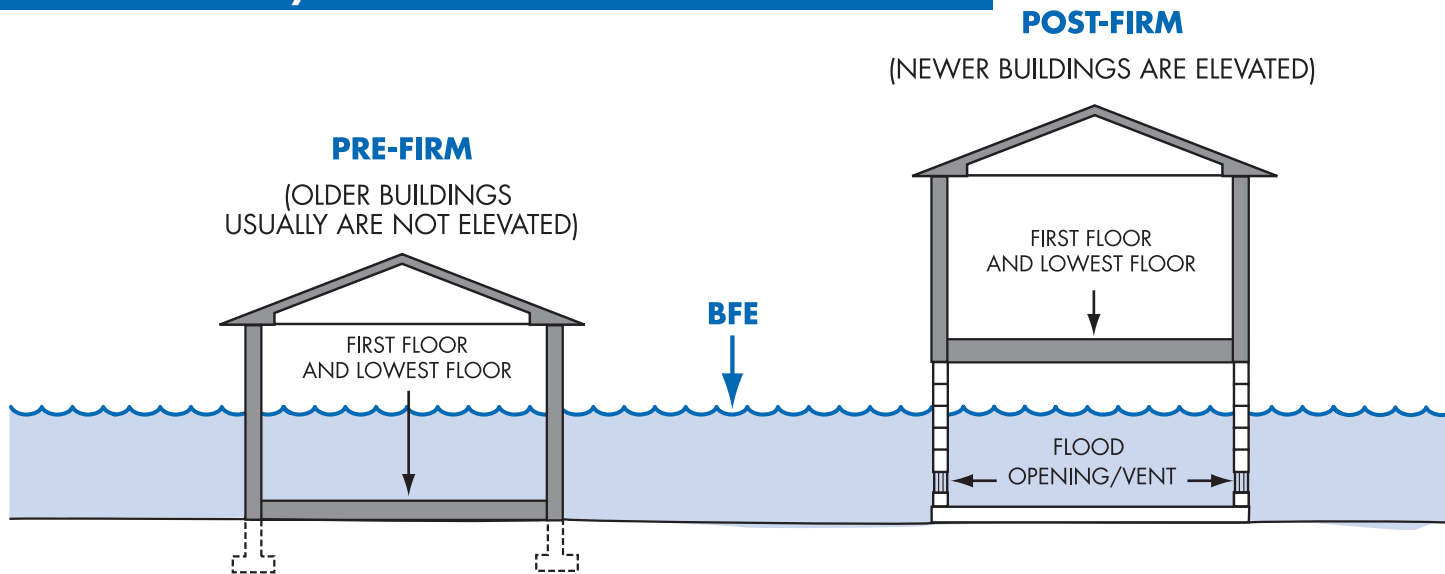


Floodplain land put into public/common open space, net density remains, lot sizes reduced and setbacks modified to keep homesites on high ground.

RECOMMENDED

Let the floodplain perform its natural function – if possible, keep it as open space. Other compatible uses: recreational areas, playgrounds, reforestation, parking, gardens, pasture and created wetlands.

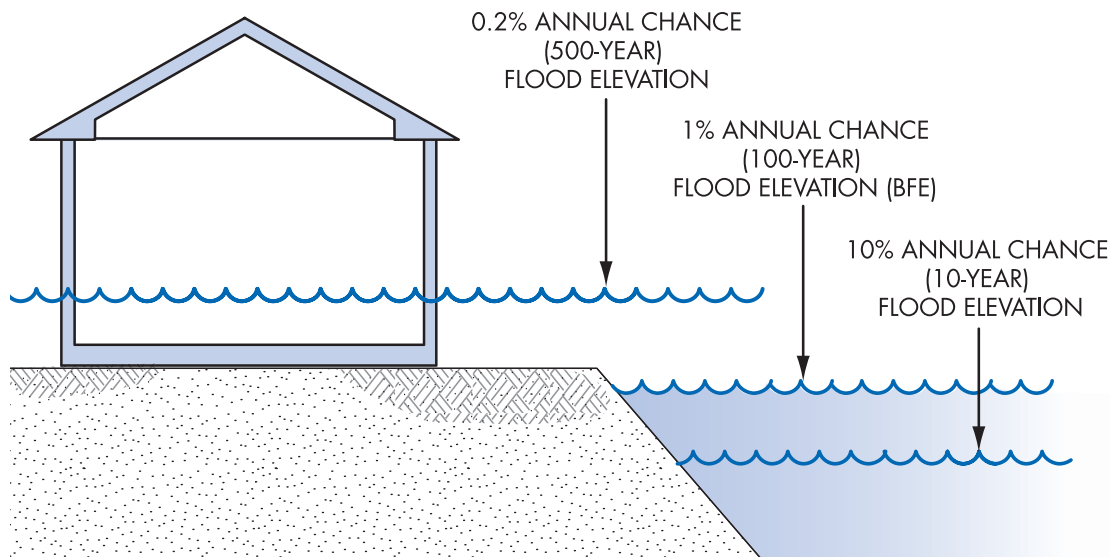
What is Meant by Pre-FIRM and Post-FIRM Structures?



A building is **Pre-FIRM** if it was built **before** the date of your community's first FIRM. If built **after** that date, a building is **Post-FIRM**. Find the initial FIRM's date online at www.fema.gov/cis/NC.pdf or call your community's planning, engineering or permit office.

Permits are required for improvements or repairs to Pre-FIRM buildings, which may have to be elevated to the BFE on the current FIRM ([see pages 59 through 65](#)).

Nature Doesn't Read Flood Maps



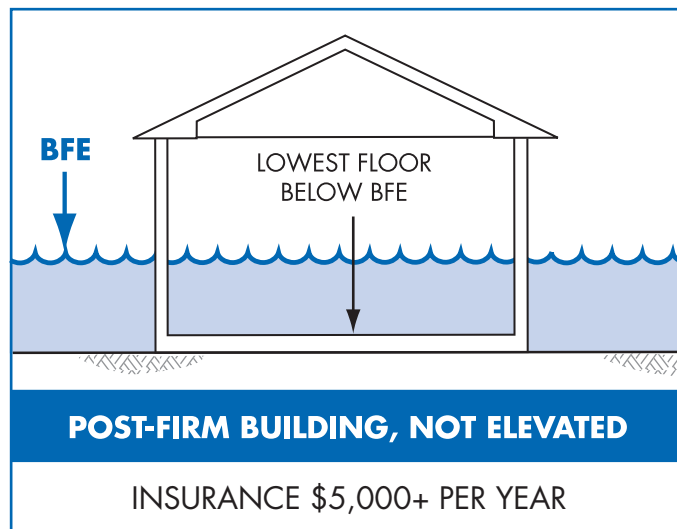
Important

Information

Many people don't understand just how risky the floodplain can be. There is a greater than 26% chance that a non-elevated home in the SFHA will be damaged during a 30-year mortgage period. The chance that a major fire will occur during the same period is less than 5%!

CAUTION! Nature doesn't read the flood map! Major storms and flash floods can cause flooding that rises higher than the Base Flood Elevation (BFE). Be safer – protect your home or business by building higher. [See page 39](#) to see how this will save you money on flood insurance.

Think Carefully Before You Seek A Floodplain Variance



Very specific conditions related to the property (not the owner's actions or preferences) must be satisfied to justify a variance:

- Good and sufficient cause
- Unique site conditions
- Non-economic hardship
- If in the floodway, no increase in flood level

A variance that allows construction below the BFE does not waive your lender's flood insurance requirement. Flood insurance will be very expensive – perhaps more than \$5,000 per year ([see page 39](#))!

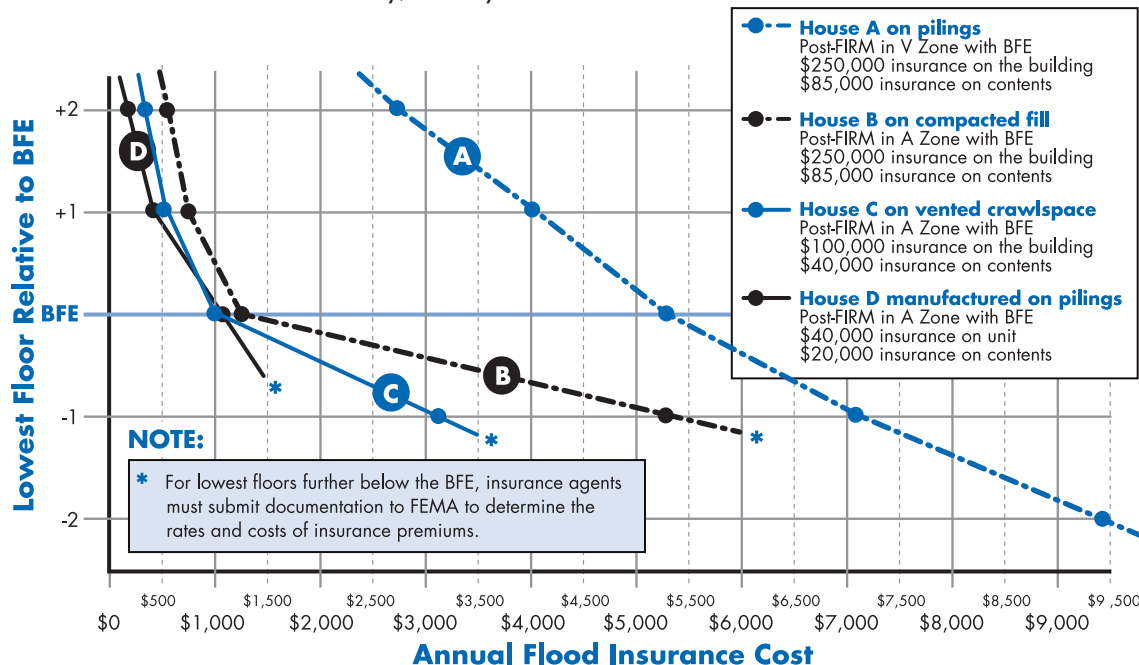
Think carefully before seeking a variance to build below the Base Flood Elevation.

Not only will your property be more likely to suffer damage, but insurance will be very costly.

If your community has a pattern of issuing variances, sanctions could be imposed – costing you even more!

Freeboard: Build Higher, Reduce Damage, Save on Insurance

Want to save some money and have peace of mind at the same time?
Then add freeboard to build higher than the minimum elevation requirement!
Freeboard is a factor of safety, usually one or two feet above the BFE.



Important

Information

NOTE: Flood insurance rates and various fees change from time to time. Rather than specific costs for insurance, these figures give a feel for how much difference just a foot or two can make.

Remember! When building a new home, be sure the builder checks the floor elevation as part of the foundation inspection. An error of just 6 to 12 inches could more than double what you have to pay for NFIP flood insurance.

The community may be able to grant a variance, but the owner will probably still be required to buy insurance. Imagine trying to sell a house if the bank requires insurance that costs more than \$5,000 a year!

What is the Elevation Certificate and How is it Used?

- The Elevation Certificate (EC) is a FEMA form. Go to www.fema.gov/ and search for "Elevation Certificate."
- The EC must be completed and sealed by a professional land surveyor or civil engineer.
- The property owner, owner's representative or the community official may complete the EC for sites in Approximate A Zones and AO Zones.
- It can be used to show that the grades of building sites are above the Base Flood Elevation ([see page 30](#)).
- It is used to verify that buildings are elevated properly ([see page 42](#)).
- Insurance agents use the EC to write and rate flood insurance policies.
- [See page 72](#) for online EC training and state workshop information.

By itself, the EC cannot be used to waive the requirement to obtain flood insurance. [See page 28](#) to learn about FEMA's Letter of Map Amendment process.

ELEVATION CERTIFICATE

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

SECTION A: PROPERTY INFORMATION

1. Building Owner's Name
2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
City State ZIP Code
3. Property Description (Lot and Block Numbers, Tax Parcel Number, Larger Description, etc.)

SECTION B: FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

4. Map/Firm Number
5. Section Number
6. Section Date
7. Section Date
8. Section Date
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97. Section Date
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99. Section Date
100. Section Date

SECTION C: BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

1. Building elevations are based on:
2. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
3. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
4. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
5. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
6. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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57. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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60. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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62. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
63. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
64. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
65. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
66. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
67. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
68. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
69. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
70. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
71. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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73. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
74. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
75. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
76. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
77. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
78. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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80. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
81. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
82. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
83. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
84. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
85. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
86. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
87. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
88. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
89. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
90. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
91. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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93. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
94. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
95. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
96. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
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98. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
99. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)
100. Elevation - Zone A1-A30, AE, AH, A99, BFE, V, X, Y, Z, or other (Specify)

SECTION D: SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a licensed surveyor, engineer, or architect authorized by law to certify elevation information. (Specify that the information on this certificate is prepared by the person who is authorized to certify the data provided.)

Check here if comments are provided on back of form.

Certifier's Name _____ License Number _____
Title _____ Company Name _____
Address _____ City _____ State _____ ZIP Code _____
Signature _____ Date _____ Telephone _____

PLACE SEAL HERE

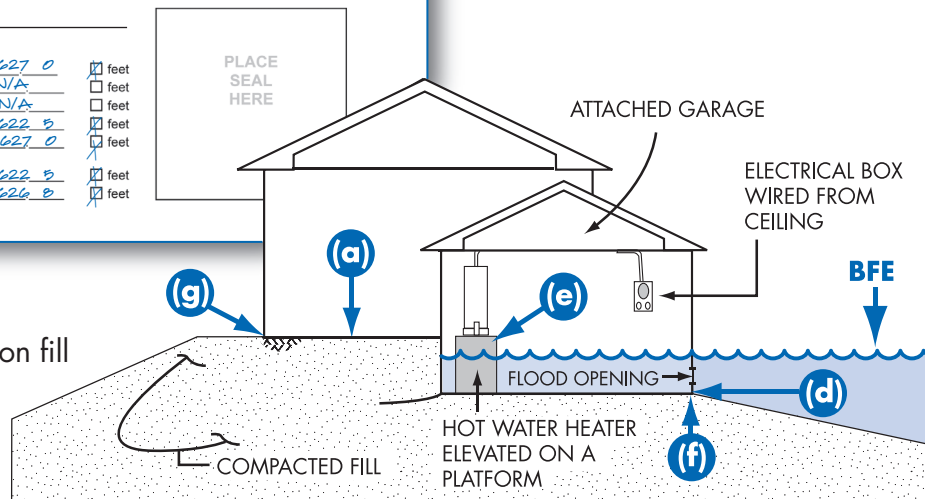
Completing the Elevation Certificate

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)			
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input checked="" type="checkbox"/> Finished Construction			
*A new Elevation Certificate will be required when construction of the building is complete.			
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.			
Benchmark Utilized <u>PA0025</u> Vertical Datum <u>NAVD 1988</u>			
Conversion/Comments _____			
a) Top of bottom floor (including basement, crawl space, or enclosure floor).	<u>627.0</u>	<input checked="" type="checkbox"/> feet	<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto; text-align: center; line-height: 100px;">PLACE SEAL HERE</div>
b) Top of the next higher floor	<u>N/A</u>	<input type="checkbox"/> feet	
c) Bottom of the lowest horizontal structural member (V Zones only)	<u>N/A</u>	<input type="checkbox"/> feet	
d) Attached garage (top of slab)	<u>622.5</u>	<input checked="" type="checkbox"/> feet	
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments)	<u>627.0</u>	<input checked="" type="checkbox"/> feet	
f) Lowest adjacent (finished) grade (LAG)	<u>622.5</u>	<input checked="" type="checkbox"/> feet	
g) Highest adjacent (finished) grade (HAG)	<u>626.0</u>	<input checked="" type="checkbox"/> feet	

ELEVATION CERTIFICATE (partial)

In this example, the BFE is 625.0 feet.

The slab-on-grade house was elevated on fill 2 feet above the BFE; the vented garage is 2.5 feet below the BFE.



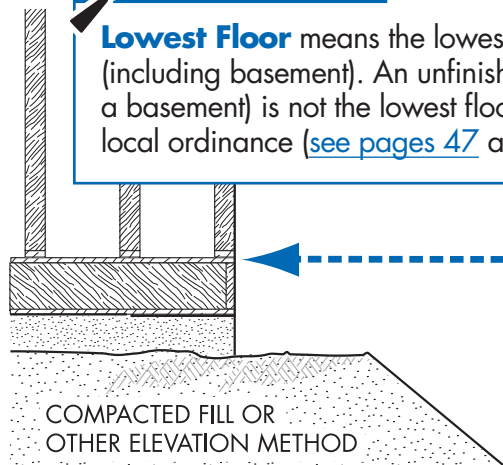
When you get your building permit you will be informed about when in the construction process you **must** submit Elevation Certificates. You must have a professional land surveyor or civil engineer fill out and seal the EC form. The EC includes diagrams for eight building types. Several points must be surveyed.

Paperwork is Important – for You and Your Community



Terms and Definitions

Lowest Floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure (that is not a basement) is not the lowest floor if the enclosure is built as required in the local ordinance ([see pages 47](#) and [53](#)), which includes limited uses.



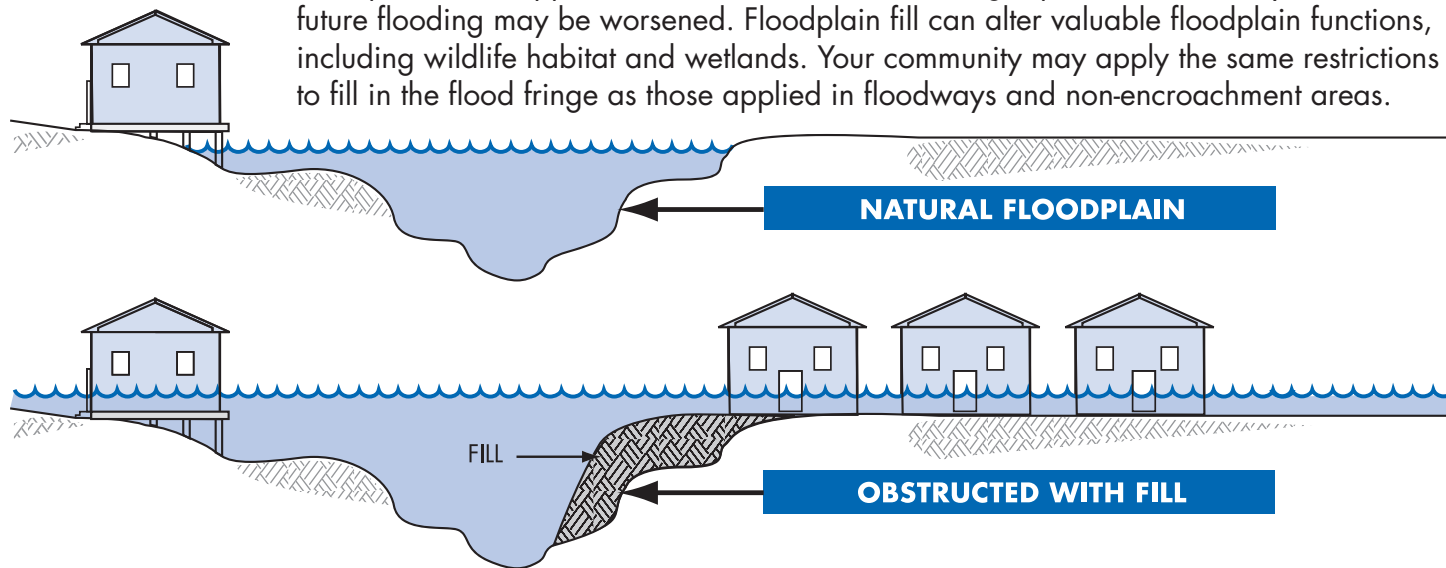
If you get a permit to build in the floodplain, a FEMA Elevation Certificate or a similar documentation will be required as soon as your lowest floor is set. An “as-built” survey and Elevation Certificate will be required when construction is completed.

This form is important! It proves that you built correctly.

It can be used to obtain the correct insurance rating.

Floodplain Fill Can Make Things Worse

Floodplains are supposed to store floodwater. If storage space is blocked by fill material, future flooding may be worsened. Floodplain fill can alter valuable floodplain functions, including wildlife habitat and wetlands. Your community may apply the same restrictions to fill in the flood fringe as those applied in floodways and non-encroachment areas.



Make sure your floodplain fill project won't harm your neighbors. Before deciding that your project requires the placement of fill, check with your community's planning, engineering or permit office. You may be required to demonstrate that fill will have "no impact" ([see page 44](#)).

Required “No Impact” Certification

- Floodways and non-encroachment areas can be dangerous because water may flow very fast.
- “No Impact” means no increase in flood elevations greater than 0.00 ft, no increase in floodway or non-encroachment area widths, and no decrease in flood elevations of more than 0.1 ft.
- An engineer must evaluate the hydraulic impact of proposed development. A “no impact” certification with supporting documentation is required and must be signed, sealed and dated by a registered professional engineer.
- Check with your community for guidance before you decide to work in a floodway.

ENGINEERING “NO IMPACT” CERTIFICATION (example)

This is to certify that I am a duly qualified engineer licensed to practice in the State of North Carolina. It is to further certify that the attached technical data supports the fact that proposed (Name of Development) will not impact the 100-year flood elevations, floodway elevations and floodway widths on (Name of Stream).

Signature _____ Seal _____

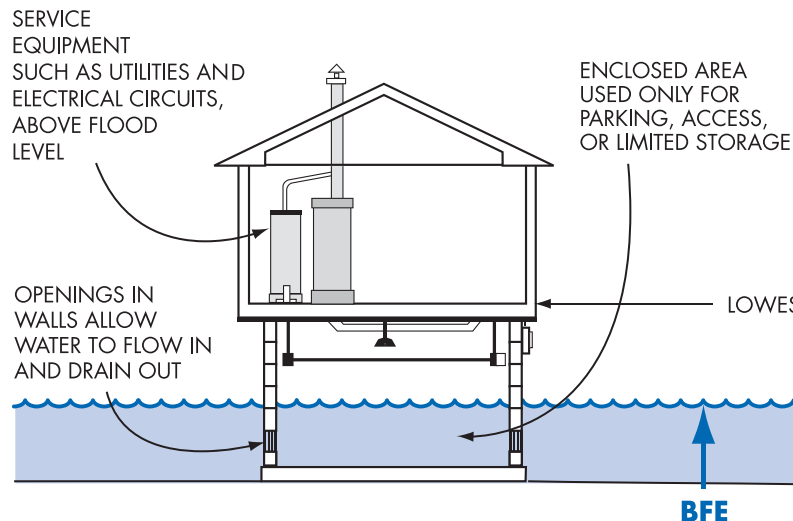


**National Flood
Insurance
Program**

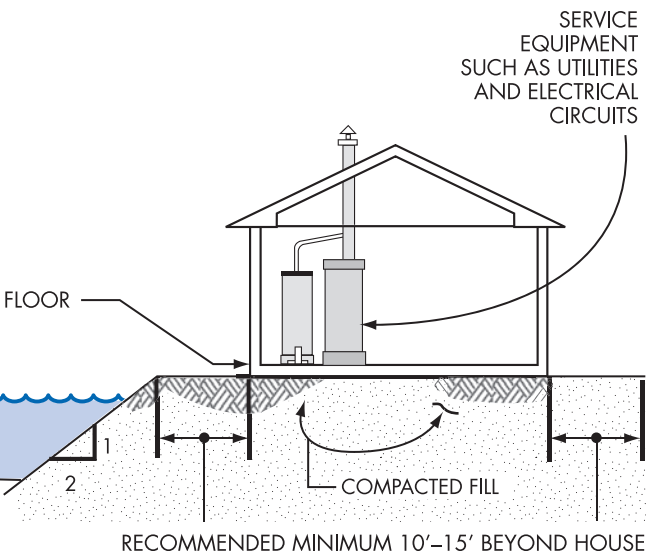
The engineering analysis must be based on technical data obtained from the state or FEMA.
Save time and money – don’t build in the floodway!

How to Elevate Your Floodplain Building (Riverine)

ELEVATE ON FOUNDATION WALLS



ELEVATE ON FILL



CAUTION! Enclosures (including crawlspaces) have some special requirements ([see pages 47 and 48](#)).

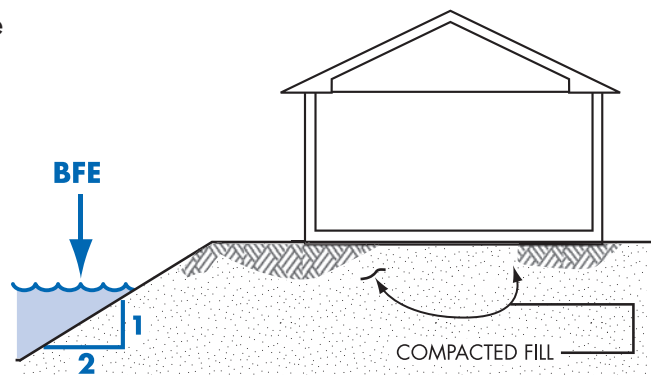
Note: When the walking surface of the lowest floor is at the BFE, under-floor utilities are not allowed.

Fill used to elevate buildings must be placed properly ([see page 46](#)).

Compaction of Floodplain Fill (A Zones)

Earthen fill used to raise the ground above the flood elevation must be placed properly so that it does not erode or slump when water rises. For safety and to meet floodplain requirements, floodplain fill should:

- Be good clean soil, free of large rocks, construction debris and woody material (stumps, roots)
- Be machine-compacted to 95 percent of the maximum density (determined by a design professional)
- Extend 10 to 15 feet beyond the footprint of the structure
- Have graded side slopes that are not steeper than 2:1 (one foot vertical rise for every 2 feet horizontal extent); flatter slopes are recommended
- Have slopes protected against erosion (vegetation for "low" velocities, durable materials for "high" velocities – determined by a design professional)



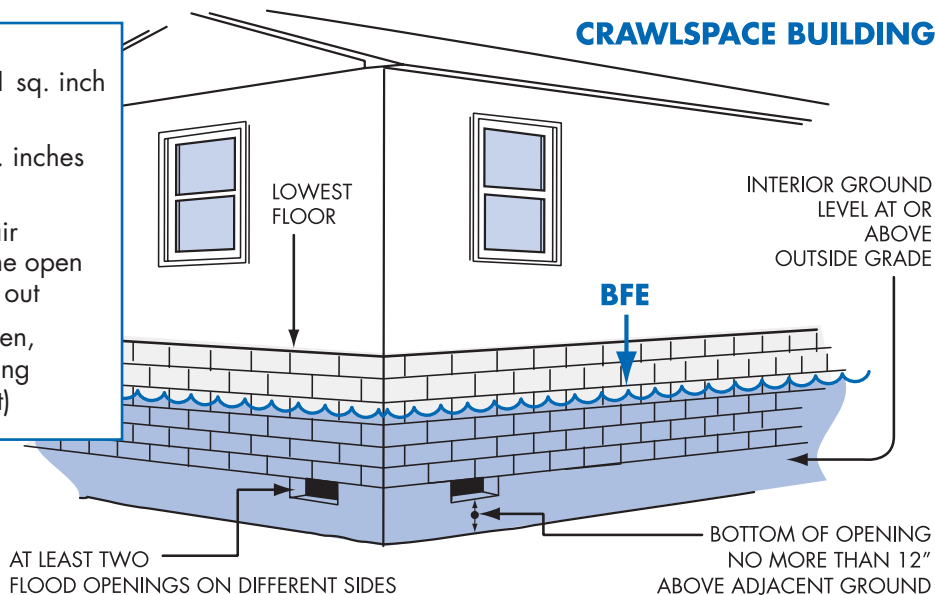
Communities may ask for a licensed engineer to certify the fill elevation, compaction, slope and slope protection materials in order to determine that the proposed structure will be "reasonably safe from flooding."

Enclosures Below the BFE (A Zones)

NOTE:

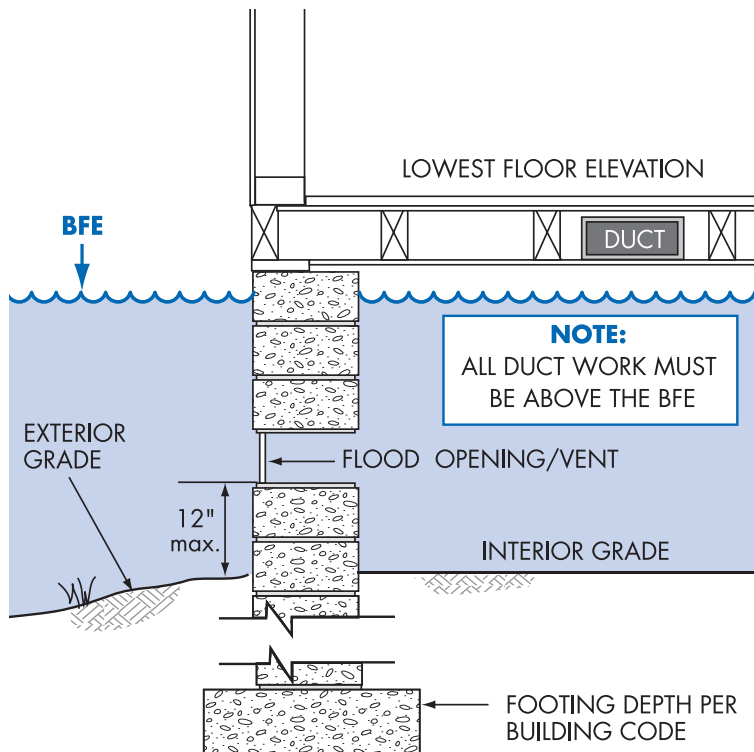
- Total net area of all total openings is 1 sq. inch per sq. foot of enclosed area
- A 30' x 40' building needs 1,200 sq. inches of openings
- If inserted in flood openings, typical air ventilation units must be disabled in the open position to allow water to flow in and out
- A typical air ventilation unit, with screen, provides 42 to 65 sq. inches of opening (look for "net free area" stamp on unit)

ALTERNATIVE: Engineered openings are acceptable **if certified** to allow adequate automatic inflow and outflow of floodwaters.



Solid perimeter wall foundations can enclose flood-prone space. A crawlspace is a good way to elevate just a couple of feet. In all cases, the following are required: flood vents/openings, elevated utilities, flood-resistant materials and limitations on use.

Crawlspace Details (A Zones)

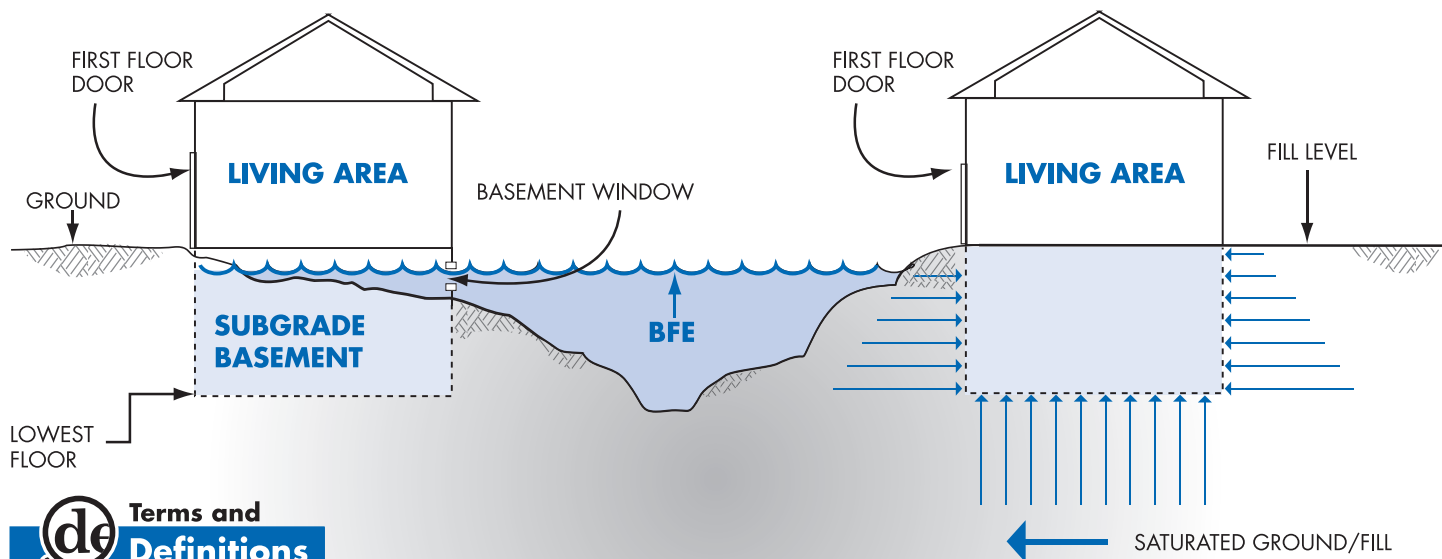


- The Lowest Floor Elevation must be at or above the BFE.
- All materials below the BFE must be flood resistant
- The bottom of flood openings/vents must be no more than 12 inches above grade.
- Standard air ventilation units must be disabled in the "open" position to allow water to flow in and out.
- Interior grade must be equal to or higher than exterior grade on at least one side.

Calculate Net Flood Opening:

A building that measures 30' x 40' has 1,200 square feet of enclosed crawlspace. Flood vents must provide 1,200 sq. in. of net open area (or have certified engineered openings). If a standard air vent unit provides 60 sq. in. of net open area, 20 vent units are required to satisfy the flood opening requirement (1,200 divided by 60).

Basements Are Especially Flood-Prone

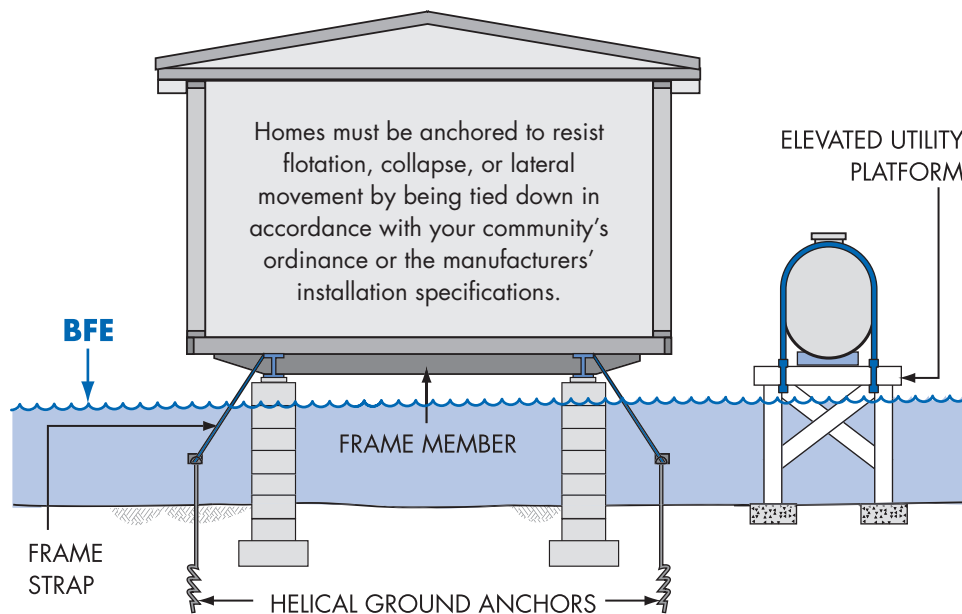


Terms and Definitions

A **basement** is any portion of a building that has its floor sub-grade (below ground level) on all sides.

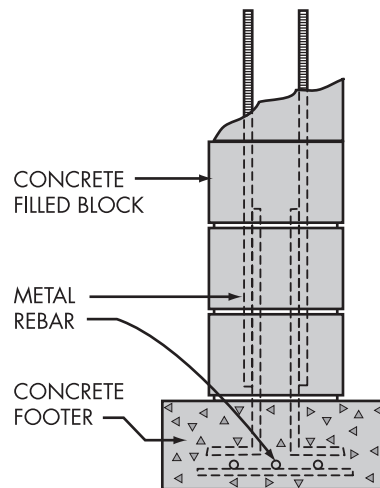
Basements below the BFE **are not** allowed in new buildings and flood insurance coverage is very limited in existing basements for a very good reason. It only takes an inch of water over the sill and the entire basement fills up! Excavating a basement into fill doesn't always make it safe because saturated groundwater can damage the walls.

Manufactured Homes Require Special Attention



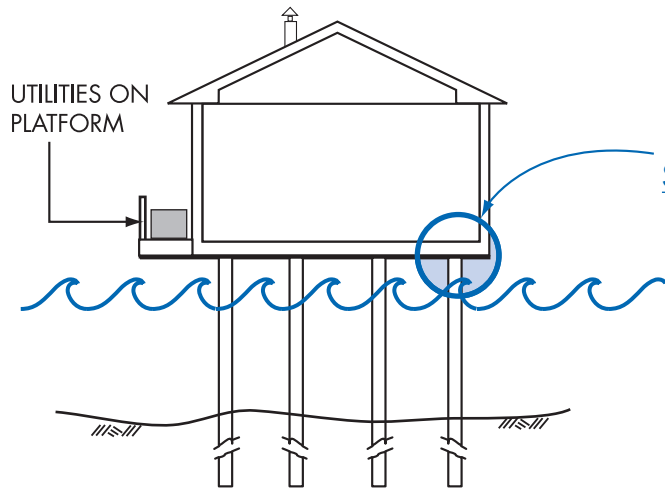
In North Carolina, new manufactured homes are prohibited in floodways, non-encroachment areas and V Zones.

Experience shows that manufactured homes are easily damaged. As little as 1 foot of water can cause substantial damage.



Typical Elevation Methods for Coastal Buildings

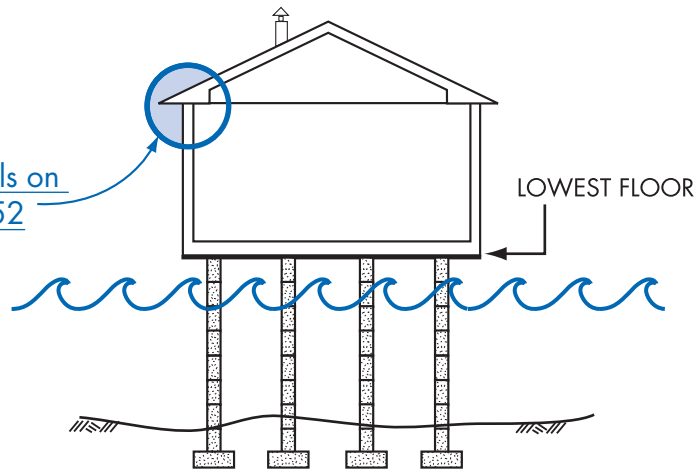
ELEVATE ON PILINGS



Wood or Metal Piles Installed to Proper Depth

See details on
[page 52](#)

ELEVATE ON COLUMNS

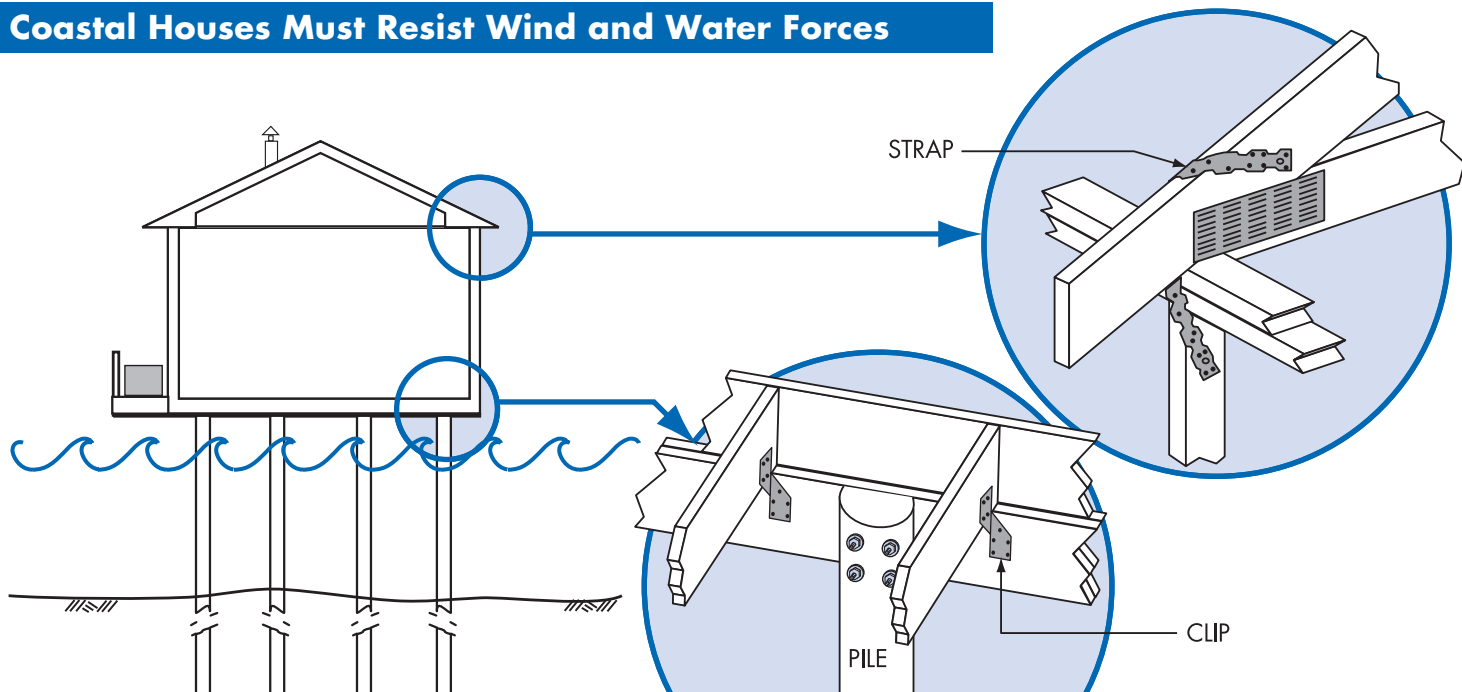


**Reinforced Masonry or
Concrete Columns on Spread Footers**

In V Zones the design specifics will be determined by your architect or engineer based on your site, including how your building will be elevated and how deep in the ground the foundation elements will extend.

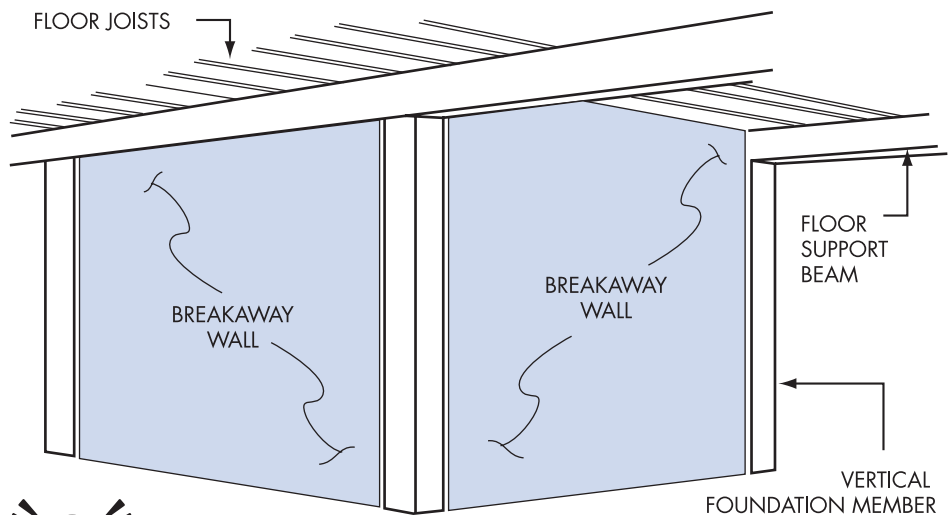
Your community will require certified or sealed building designs and plans ([see page 54](#)).

Coastal Houses Must Resist Wind and Water Forces



Coastal buildings may be exposed to both high winds, waves and floodwater, so they must be built to hold together during storms. These details are only examples. Your architect or engineer will specify the type of clips and straps to keep the roof and building connected to the foundation.

Enclosures Below V Zone Buildings



Important

Information

Do not modify an enclosure below an elevated V Zone building (or any zone for that matter)! It is a violation of your community's regulations, and you may have increased damage when it floods. Plus, your flood insurance policy will cost a lot more!

Avoid building an enclosure under your V Zone building. If you must enclose a small area, your community will require:

- Walls must be designed to collapse or "breakaway" under storm and flood conditions
- Must be unfinished and use flood resistant materials
- Utility wires and pipes should not go through or be attached to the breakaway walls
- Enclosed area is to be used only for parking, building access or limited storage
- No bathrooms, utility rooms or electric service below BFE
- Size limited to less than 300 square feet (or insurance premiums are higher)

State of North Carolina V Zone Certification

STATE OF NORTH CAROLINA V-ZONE CERTIFICATION (partial)

SECTION I: FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

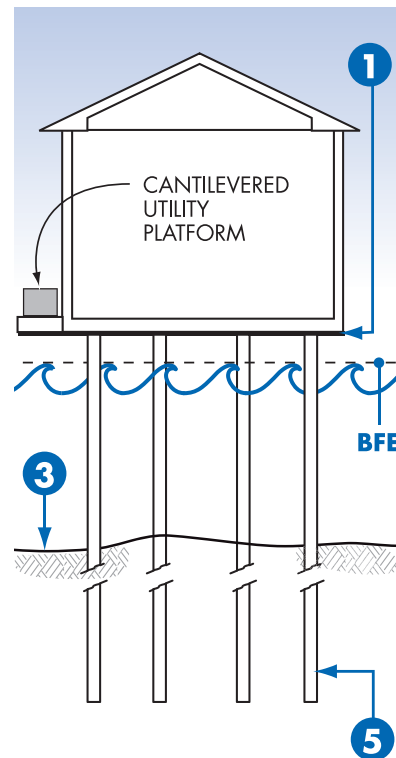
Note: This form is not a substitute for an Elevation Certificate.
Elevations should be rounded to nearest one tenth (1/10) of a foot.

Map & Panel Number (10 digits)	Suffix	FIRM Index Date	FIRM Panel Date	FIRM Zone	BFE(s)
3720316700	J	FEB 16, 2007	APR 3, 2006	VE	14.0

SECTION II: ELEVATION INFORMATION

- Elevation of the Bottom of Lowest Horizontal Structure Member of the Lowest Floor _____ 16.0 feet
- Lowest Elevation of machinery and/or equipment servicing the structure.
Describe: ON PLATFORM _____ 17.5 feet
- Elevation of Lowest Adjacent Grade [at structure including attached deck and/or garage location] _____ 7.5 feet
- Approximate Depth of Anticipated Scour/Erosion Used for Foundation Design 3.5 feet / _____ feet
- Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade _____ 16 feet

A registered professional engineer or architect must review or prepare your building design and provide a signed and sealed statement that the design meets minimum design and construction requirements.



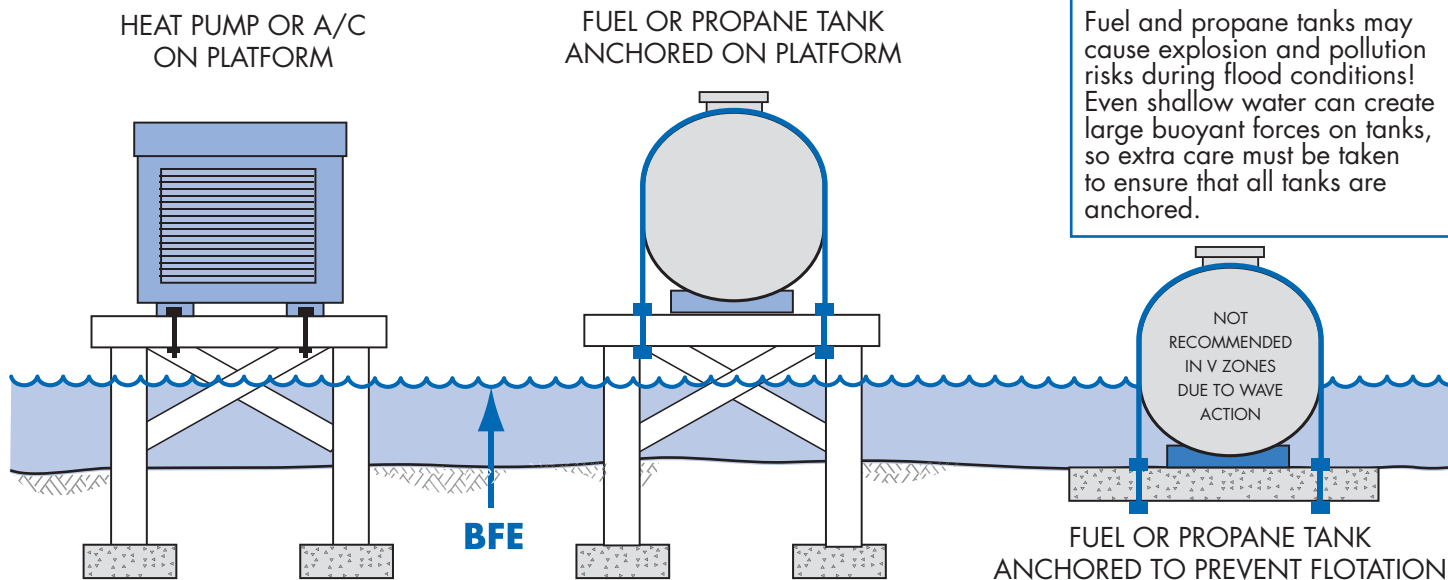
Utility Service Outside Buildings



Important

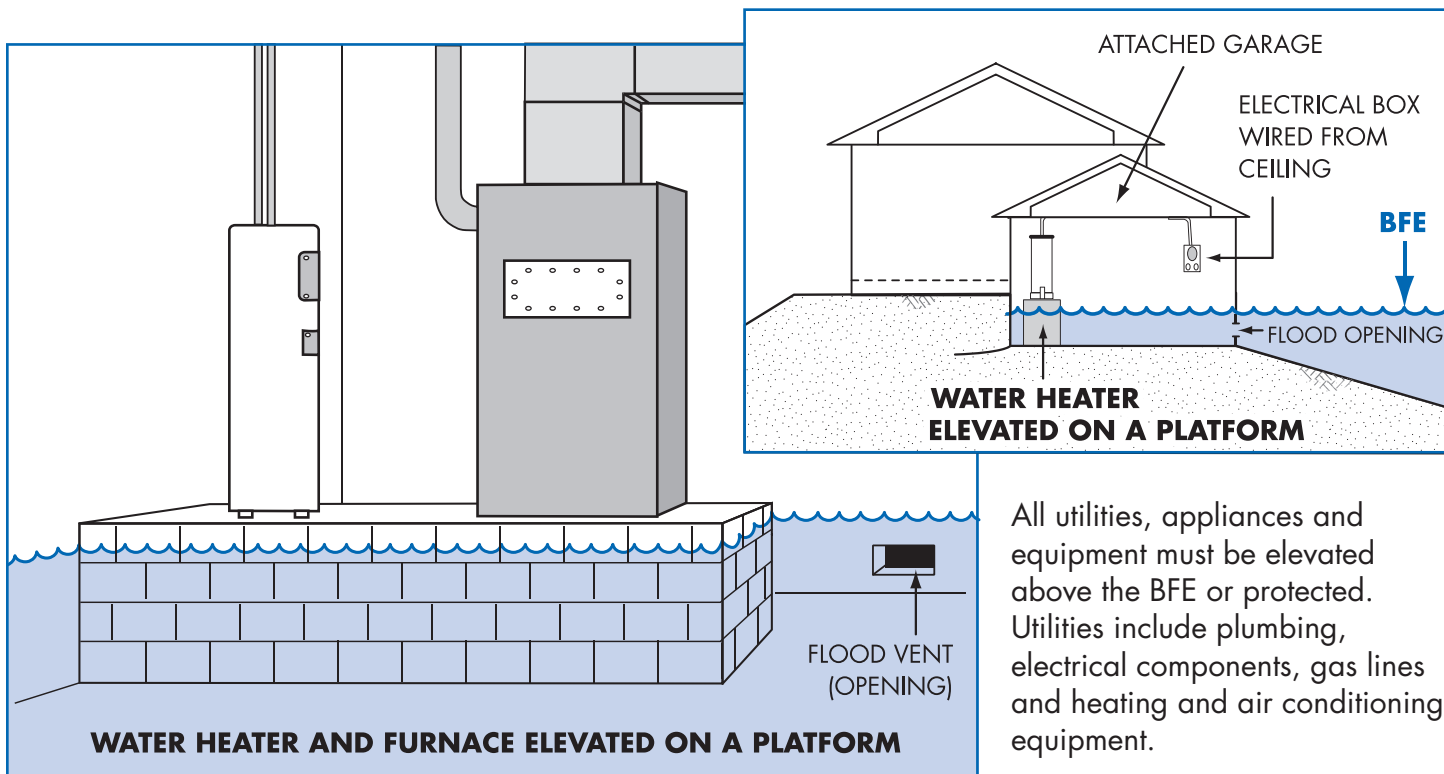
Information

Fuel and propane tanks may cause explosion and pollution risks during flood conditions! Even shallow water can create large buoyant forces on tanks, so extra care must be taken to ensure that all tanks are anchored.



Whether inside an attached garage or outside the building, all utilities, appliances and equipment must be elevated above the BFE or protected against flood damage. Utilities include plumbing, electrical components, gas lines, fuel tanks and heating and air conditioning equipment.

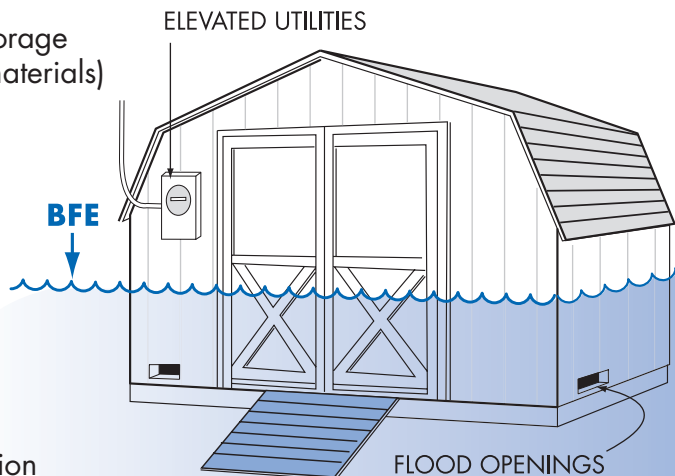
Utility Service Inside Enclosures



Accessory (Appurtenant) Structures

In Special Flood Hazard Areas, accessory and appurtenant structures must:

- Not be habitable
- Be used only for parking or storage (not pollutants or hazardous materials)
- Be anchored to resist floating
- Have flood openings/vents
- Be built of flood-resistant materials
- Have elevated utilities
- Not be modified for different use in the future
- Have documented floor elevation



Terms and Definitions

Accessory (Appurtenant) Structure means a structure that is located on the same parcel of land as a principal structure and whose use is incidental to the use of the principal structure. Accessory structures may not be used for human habitation and must be designed to minimize flood damage. Examples: detached garages, carports, storage sheds, gazebos, pole barns and hay sheds.

Even small buildings are “development” and permits or variances with noted conditions are required. They must be elevated or anchored and built to withstand flood damage.

Caution! Remember, everything inside is likely to get wet when flooding occurs.

Recreational Vehicles

In Special Flood Hazard Areas, RVs must:

- Be licensed and titled as an RV or park model (not as a permanent residence)
- Be built on a single chassis
- Have inflated wheels and be self-propelled or towable by light truck
- Have no attached deck, porch or shed
- Be used for temporary recreational, camping, travel or seasonal use (no more than 180 days)
- Have quick-disconnect sewage, water and electrical connectors



Important

Information

Camping near the water?

Ask the campground or RV park operator about flood warnings and plans for safe evacuations.

RVs that do not meet these conditions must be installed and elevated like manufactured homes, including permanent foundations and tie-downs ([see page 50](#)).

Planning to Improve Your Floodplain Building?

To obtain a permit to improve an existing building:

- You must provide a copy of your construction contract or a cost estimate (including estimated market value of your own or donated labor and materials).
- Your community will compare the cost of the proposed work to the market value of your building and check the value of improvements.
- You may submit an independent assessment of the market value of the building, if performed by a licensed appraiser.
- If the cost of the improvement equals or exceeds 50% of the market value of the building, it is considered a Substantial Improvement and you must bring the building into full compliance – this may involve raising the foundation or other measures.
- If the costs do not trigger Substantial Improvement requirements, then you should still consider ways to reduce future damage ([see page 60](#)).

Terms and Definitions

Substantial Improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage from any cause (flood, fire, earthquake, hurricanes, tornadoes, etc.), regardless of the actual repair work performed ([see page 64](#)).



Important Information

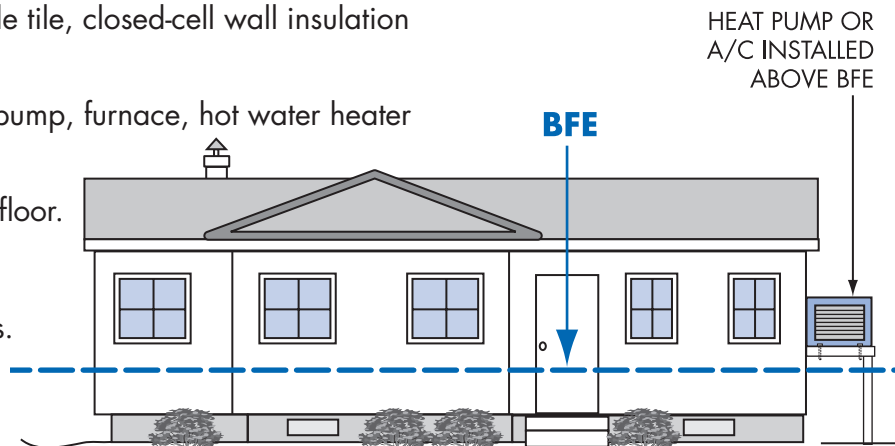
Improvements include:

- Renovation/rehabilitation of the interior of the existing building ([see page 61](#))
- Lateral addition, without renovation or structural alteration of the existing building ([see page 62](#))
- Lateral addition, with renovation or structural alteration of the existing building ([see page 63](#))
- Vertical addition (add new story)

Non-Substantial Improvements

Your proposed improvements are “non-substantial” if the costs of all improvements are less than 50% of the market value of the building. Although you are not required to bring the existing building into compliance, there are many things you can do to reduce future flood damage. Find out the BFE at your location and consider the following:

- Use flood resistant materials, for example tile, closed-cell wall insulation and polyvinyl wall coverings.
- Raise air conditioning equipment, heat pump, furnace, hot water heater and other appliances on platforms.
- Install electrical outlets higher above the floor.
- Move ductwork out of crawlspaces.
- Retrofit crawlspaces with flood openings.
- Fill in below-grade crawlspaces/utility space.



Note! Be sure to include ALL proposed work in your initial permit application. If you add more work after the permit is issued, your community will make another evaluation for Substantial Improvement.

Substantial Improvement: Renovation Only



Important

Information

Floodplain buildings can be improved, renovated, rehabilitated or altered, but special rules apply.

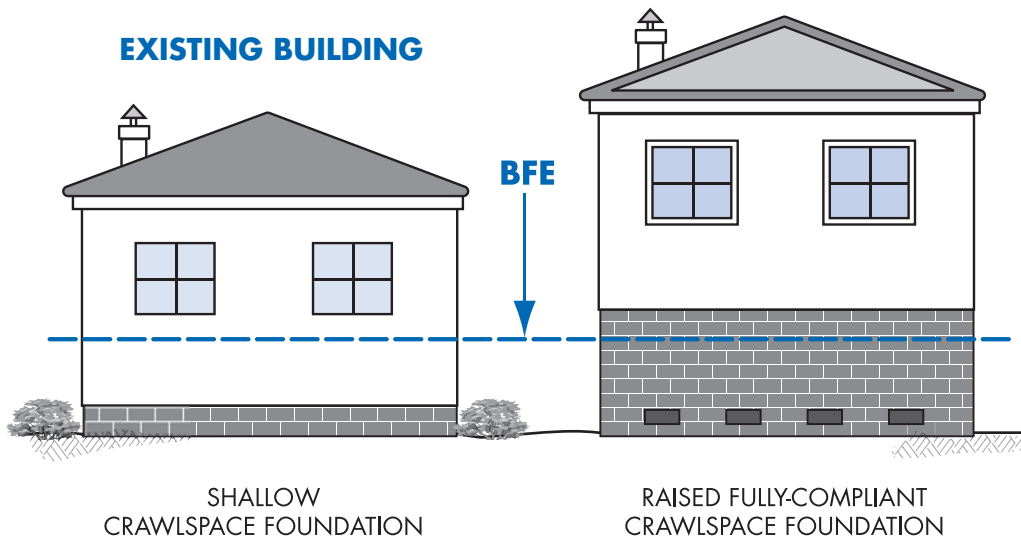
Check with your local permit office before you begin. It will be easier to do it right the first time.

The cost to correct previously cited violations of state or local health, sanitary, or safety codes to provide safe living conditions can be excluded from the cost of renovations.

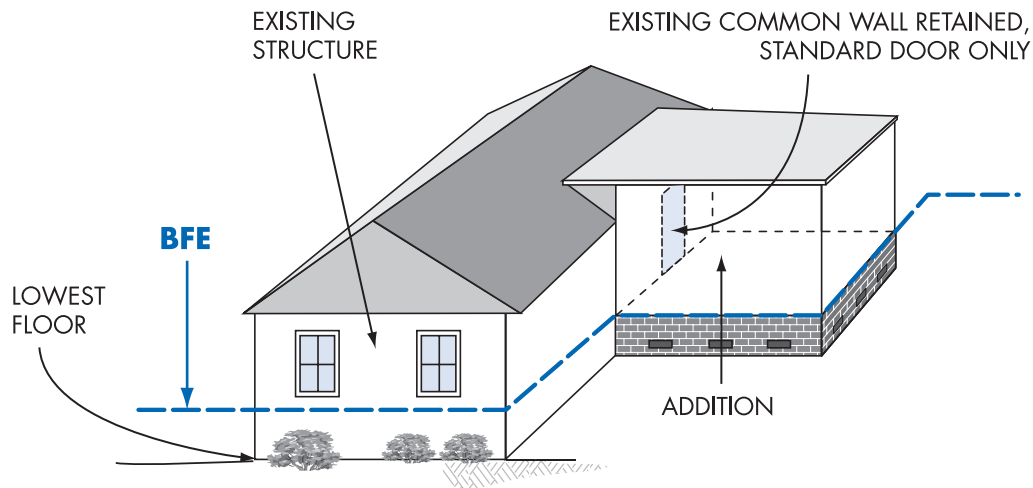
Alteration of a registered historic structure is allowed, by variance, as long as it will continue to meet the criteria for listing as a historic structure.

RENOVATED/REHABILITATED BUILDING

EXISTING BUILDING



Substantial Improvement: Lateral Addition Only



Important

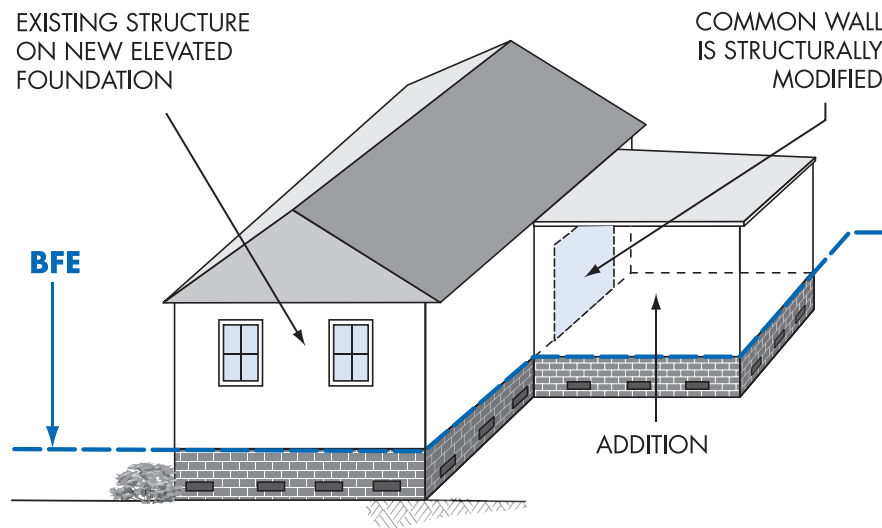
Information

See page 63 if your project to add a lateral addition also includes modifying the interior of the existing building or making structural modifications to the existing common wall.

You must get a permit from your community to build an addition to your floodplain building. Only the addition must be built with the lowest floor at or above the Base Flood Elevation provided:

- You make no interior modifications to the existing building; and
- You make no structural modifications to the existing common wall other than adding a standard 36" door.

Substantial Improvement: Addition Plus Other Work

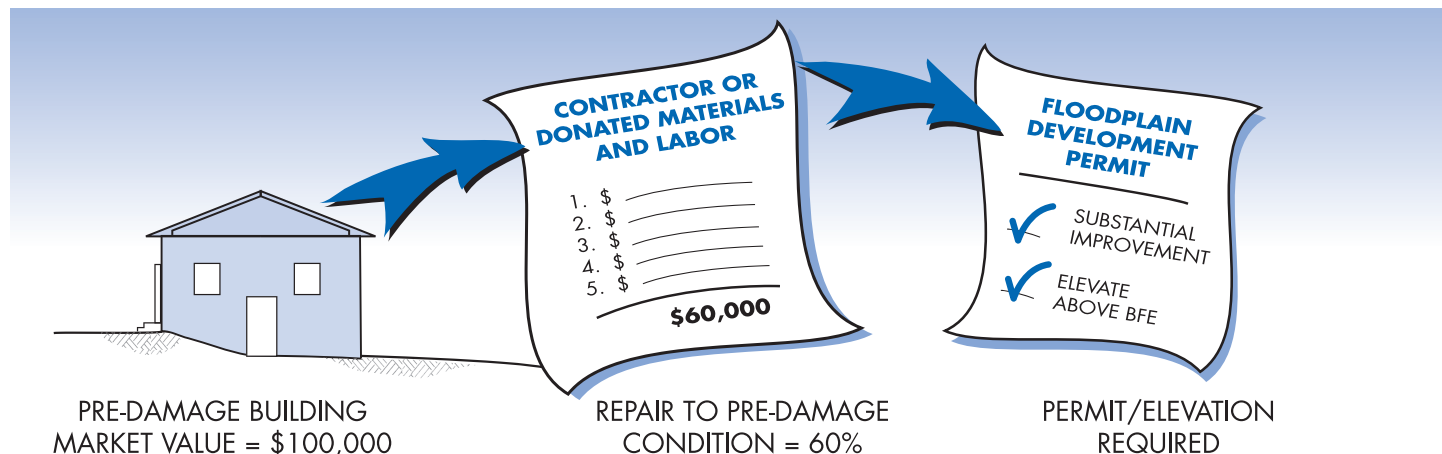


Your community must prepare an evaluation to determine if all of your proposed work will trigger the Substantial Improvement requirement. Substantial Improvement is triggered if:

- The work involves adding a new top floor, modifying the interior of the existing building or structural modifications to the existing common wall (for lateral addition); and
- The cost of all proposed work plus the cost of improvements equals or exceeds 50% of the market value of the existing building.

Your community's permit office can help you determine which requirements apply. It is always a good idea to request a preliminary review before you get too far along with your plans.

What About After Damage?



A permit is required to repair a damaged floodplain structure, regardless of cause — fire, flood, wind or even a truck running into a building. You will be asked to provide a detailed cost estimate to repair it to its pre-damaged condition. If the repair costs are 50% or more of the pre-damage market value of the building, then the building is Substantially Damaged and must be brought into compliance, which may involve raising the foundation or other measures. Check with your community before you begin repairs.

[See page 66](#) for more information about elevating an existing building above a crawlspace.

Paying for Post-Flood Compliance

You may be eligible for up to \$30,000 to help pay to protect your building in compliance with your community's requirements – if all of the following apply:

USE THE ICC CLAIM TO:



ELEVATE THE HOUSE ON
YOUR LOT



DEMOLISH AND REBUILD
THE HOUSE



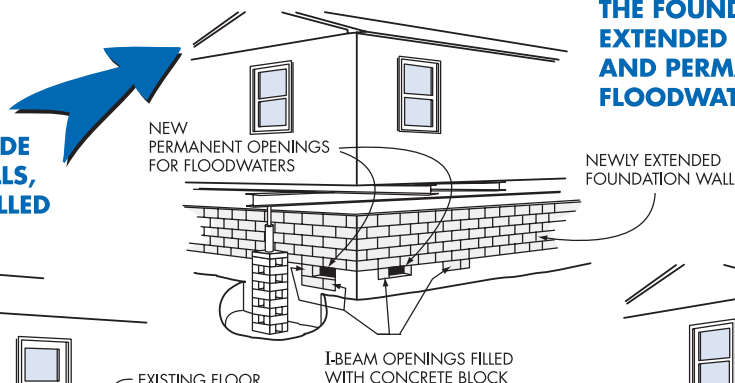
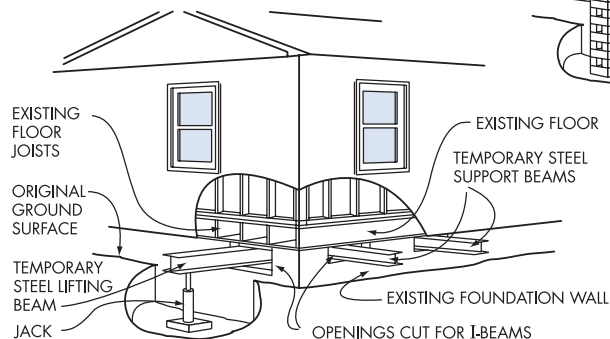
MOVE THE HOUSE TO
HIGH GROUND

- You have NFIP flood insurance – it includes Increased Cost of Compliance (ICC) coverage.
- Your building is in the mapped Special Flood Hazard Area.
- Your building's lowest floor is below the elevation required by your community.
- Your community has made an official determination that the building was substantially damaged by flooding.
- You act quickly with your claims adjuster and community official to process all the required paperwork.

Owners whose buildings are substantially damaged are required to "bring the building into compliance" with floodplain requirements. Substantial damage is a special case of substantial improvement.

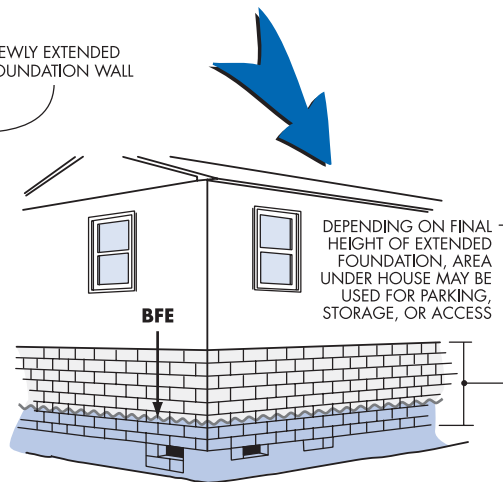
Elevating a Pre-FIRM Building

AFTER OPENINGS ARE MADE IN THE FOUNDATION WALLS, STEEL I-BEAMS ARE INSTALLED BELOW THE FLOOR JOISTS



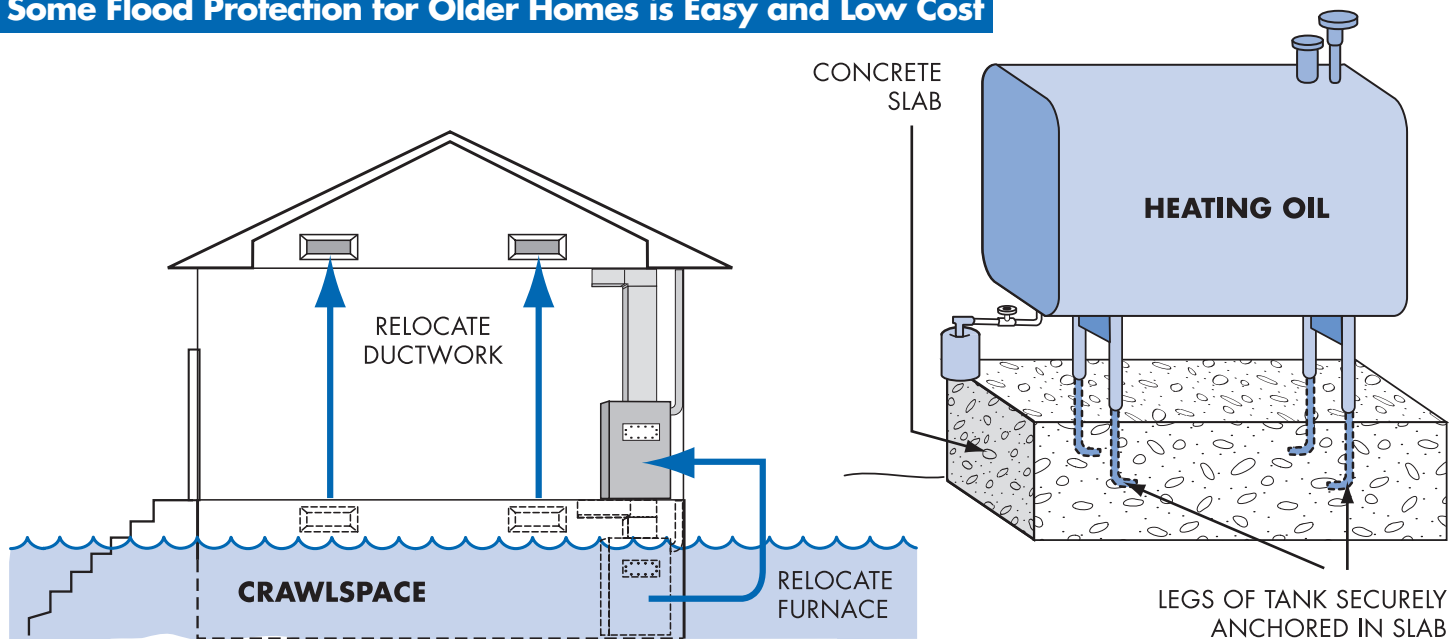
THE FOUNDATION WALLS ARE EXTENDED AS THE HOUSE IS RAISED, AND PERMANENT OPENINGS FOR FLOODWATERS ARE CREATED.

THE FINISHED PROJECT ABOVE BFE



This is one way to elevate an existing building to comply with floodplain regulations. If your insured building is damaged by flood and your community determines it is substantially damaged, you may be eligible for an **Increased Cost of Compliance** payment. The state and FEMA can help with more information and options.

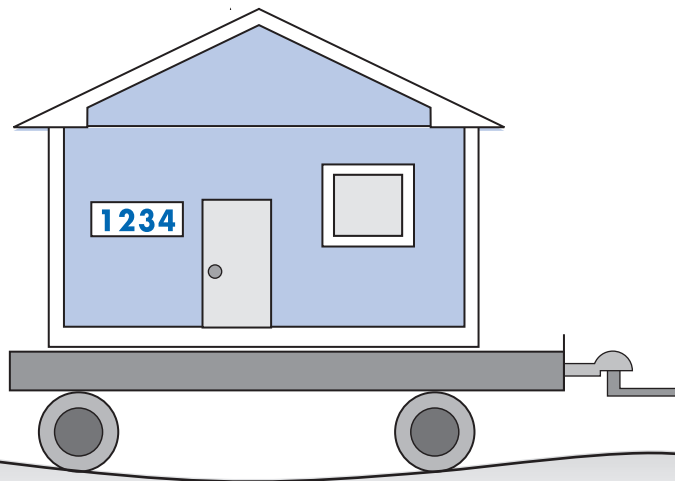
Some Flood Protection for Older Homes is Easy and Low Cost



Move water heaters, furnaces and ductwork out of crawlspaces and basements. Anchor heating oil and propane gas tanks to prevent flotation. **Do not** store valuables or hazardous materials in a flood-prone crawlspace or basement. Use water-resistant materials when you repair.

Some Flood Mitigation Projects are More Costly

But Give You More Protection



After floods, some communities buy out and demolish homes that were severely damaged. The acquired land is dedicated to open space and can be used for recreation or to help restore wildlife habitat and wetlands. Homes have been raised up on higher foundations, and others have been moved to safer high ground.

Be Prepared for Flood Emergencies

Everyone should be prepared for floods and other emergencies. You need to be prepared at home, at work, at school, and in your community.

Sometimes floods and other disasters can strike quickly and without warning. You may have to evacuate your neighborhood, workplace or school, or you may be trapped at home. Ask yourself – what would I do if basic services (water, gas, electricity and telephones) are interrupted, perhaps for several days? Local officials and emergency relief workers will be on the scene after disasters, but they cannot reach everyone right away. You need to be prepared to keep your family safer by preparing now:

- Learn about the risks in your community
- Find out if your community has a flood warning system
- Make family and workplace emergency plans
- Know where to go if you're told to evacuate
- Put together a disaster kit with supplies to last a couple of days



To learn more about preparing for disasters, visit the North Carolina emergency preparedness website at www.ReadyNC.org and click on "Family Preparedness."

Turn Around Don't Drown™

Learn about flood risks and follow these safety rules:

- When flooding is expected, stay away from creeks, streams and rivers.
- NEVER drive through flooded roads – they may be washed out.
- Passenger cars may float in only 18-24 inches of water.
- Be especially cautious at night when it is harder to recognize dangers.
- Just 6 inches of fast-moving water can knock you off your feet.
- Visit www.weather.gov/os/water/tadd/ for more advice.

**FLOODING AHEAD
TURN AROUND
DON'T DROWN**



Useful Resources and Common Acronyms

Useful Resources

- The American Red Cross addresses disaster safety, being prepared and repairing homes (Disaster Services): www.redcross.org
- FEMA has developed materials to help families and businesses prepare for floods and recover from disasters: www.fema.gov/library
- NFIP regulations (Parts 59, 60, 65 and 70): www.fema.gov/business/nfip/laws1.shtm
- CRS Resource Center: www.training.fema.gov/EMIWeb/CRS
- Association of State Floodplain Managers: www.floods.org
- North Carolina emergency preparedness: www.ReadyNC.org
- North Carolina Association of Floodplain Managers: www.ncafpm.org
- North Carolina Society of Surveyors: www.ncsurveyors.com

Common Acronyms

- BFE = Base Flood Elevation
- EC = Elevation Certificate
- FEMA = Federal Emergency Management Agency
- FIRM = Flood Insurance Rate Map
- ICC = Increased Cost of Compliance
- NFIP = National Flood Insurance Program
- SFHA = Special Flood Hazard Area (100-year floodplain)

Want to Learn More About Floodplain Management?

- For advice on flood information and permits, call your community's building permit office, engineering or planning department.
- View or download digital flood data and learn about the North Carolina Floodplain Mapping Program at www.NCfloodmaps.com.
- To order flood maps, call FEMA's Flood Map Service Center – (800) 358-9616 or enter the FEMA Map Store to order online at www.msc.fema.gov.
- FEMA's online publications can be found at www.fema.gov/library. Search by key word, title or publication number. Call (800) 480-2520 to order free printed copies.
- Find online Elevation Certificate training for surveyors by going to www.fema.gov and search on "Elevation Certificate."
- The NFIP's Community Rating System Resource Center is online at www.fema.gov/business/nfip/crs.
- Download North Carolina's "Safer Development in Floodprone Areas," a guidebook for communities interested in adopting higher development standards, at www.ncfloodmaps.com/pubdocs/development.htm.
- Find out about floodplain management conferences and training workshops at www.ncafpm.org.

Want to Learn More About Flood Insurance?

- Consumer information about flood insurance, flood risks and flood maps is online at www.floodsmart.gov. Click on “Insurance Center” to learn more about estimating the cost of a policy, finding an agent, purchasing a policy, coverage limits and exclusions, filing claims and other topics.
- At www.floodsmart.gov, click on “NFIP Resources” then “Flood Hazard Maps” to learn more about flood maps.
- Also at www.floodsmart.gov, click on “Know the Facts” to learn more about “Fast Facts,” frequently asked questions and a library of articles and brochures.
- To obtain an NFIP flood insurance policy, call your insurance agent. Most insurance companies can write an NFIP policy for you. If you need more help, call the National Flood Insurance Program’s toll free number to get the name of an agent in your area who does write flood insurance, (888) 356-6329.
- To find out how many NFIP flood insurance policies are in force in your community, or how many claims have been paid since 1978, go to www.fema.gov/business/nfip and click on “Flood Insurance Statistics.”

